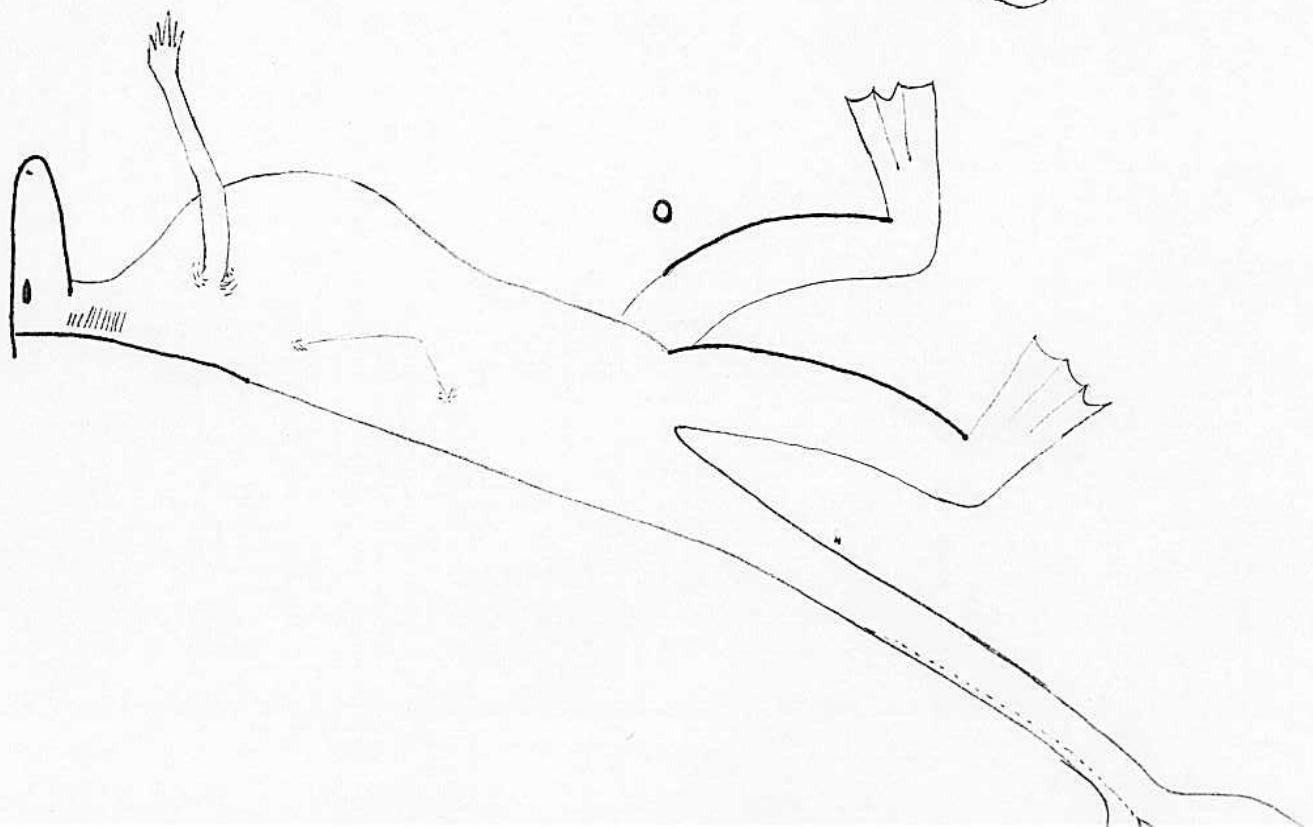
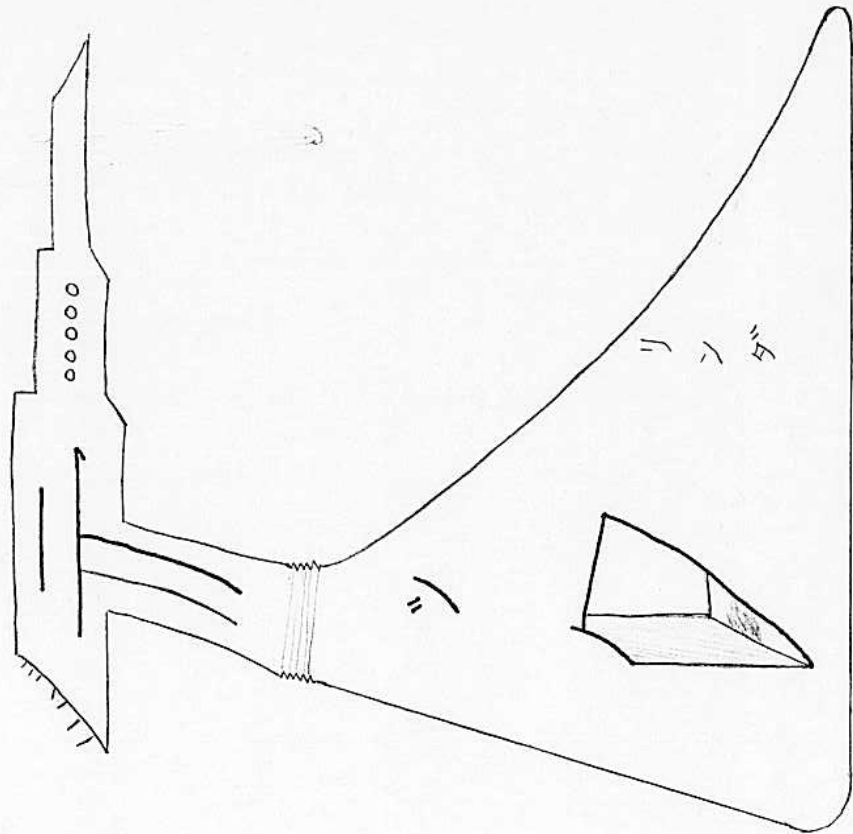


APA TECH



The Amateur Press Association by and for the members of General Technics

G.T. Buckfast

Donna Proni ♦ 530 West Walnut Street ♦ Kalamazoo ♦ MI 49007 ♦ (616) 342-4967

Shalmaneser

Greg Ruffa ♦ 10380 Maya Linda Road, Apt. C-303 ♦ San Diego ♦ CA 92126 ♦ (619) 695-8647

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Roxanne
\$11.91

Minac & Copy Count

Minac is Two pages every four months. The copy count is thirty.

Members Added

Lee Hart, Scott Shields

Members Dropped

Alice Bentley

Next Deadline

The next deadline is Wednesday, July 1st in San Diego. **However** - Greg and I hope to have a collating party at Westercon in Oakland. This means that if you're going to the convention you can bring your zine (already duped, please) and give it to one of us there. If you're not going to the con, you can send it to Greg as usual - **but only if you are sure he'll get it by June 29th.** You can also send it to the hotel addressed to either Greg or me at the following address: Oakland Hyatt Regency • 1001 Broadway • Oakland, CA 94607. Again, if you send it be sure you allow enough time for it to reach us by July 3rd.

Notes from the chair

Once again I want to impress on you all that next month it is **very important** that you send your zines a little early. If this collation works out, then we will again be doing it at CactusCon (the NASFiC). For those of you who'll be there, this will save you postage both in sending your zine and receiving your Apa.

I want to welcome Lee as an active contributor (instead of just a name on the roster for 4 issues), and also I want to welcome Scott Shields. I hope you both find this a nice place to stay for a while.

This is our 8th anniversary, and I for one am pretty impressed at how active we've become and stayed. Our roster is still five short of our maximum though, so let's try and recruit some new members. Greg wonders if we should lower the copy count - I'm reluctant to do so since our roster has changed (both up and down) virtually every issue. I don't mind having spec copies lying around, but since we do we should find some people to give them to. Let me and/or Shal know if there's someone out there who you think would be interested in joining.

Our other big question is franked material. Would you like to see some kind of guidelines? Maybe only allowing a certain percentage of a zine to be franked material. Should we let people frank a page to make minac? Let me know what you think.

See you sometime this summer I hope (with all the places we're scheduled to go, I should be seeing most of you sometime).

GTB

Roster *(incomplete)*

Andy Anda / Annette Kavanaugh (42)	1401 E. 55th St. #1004-N ♦ Chicago, IL ♦ 60615 ♦ (312) 955-9410
Guy Consolmagno (47)	200 High St. ♦ Easton, PA ♦ 18042 ♦ (215) 252-5020
Hugh Daniel (44)	P.O. Box 7213 ♦ Menlo Park, CA ♦ 94062 ♦ (415) 665-3140
Marty Franz (25)	525 W. Walnut St. ♦ Kalamazoo, MI ♦ 49007 ♦ (616) 344-1183
Barry Gehm (55)	129 Burcham, #10 ♦ East Lansing, MI ♦ 48823 ♦ (517) 337-9301
Jamie Hanrahan (18)	7685 Acama Pl. ♦ San Diego, CA ♦ 92126 ♦ (619) 271-6804
John Hall (59)	32 Knollbrook Rd., #23 ♦ Rochester, NY ♦ 14610 ♦ (716) 482-8554
Lee Hart (58)	366 Cloverdale ♦ Ann Arbor, MI ♦ 48105 ♦ (313) 994-0784
Bill Higgins (17)	853 Lorlyn Dr., Apt. 1E ♦ West Chicago, IL ♦ 60185 ♦ (312) 293-1050
Valli Hoski / Joachim Schürmann (13)	530 W. Walnut St. ♦ Kalamazoo, MI ♦ 49007 (mailing address)
Bonnie Jones (43)	129 Burcham, #1 ♦ East Lansing, MI ♦ 48823 ♦ (517) 351-0278
Dave Levine (26)	117 N.W. Trinity Pl., #37 ♦ Portland, OR ♦ 97209 ♦ (503) 224-6427
Linda Struwe- Matsushita (51)	2-15-1 Kosobe #302 ♦ Takatsuki, Osaka 569 ♦ JAPAN ♦ 011-81-726-81-2589
Sam Paris (45)	P.O. Box 41067 ♦ Chicago, IL ♦ 60641 ♦ (312) 685-7768
Dave Powell / Susannah West (29)	P.O. Box 98 ♦ Ripley, OH ♦ 45167 ♦ (513) 392-4549
Roxanne Meida-Shields (48)	410 S. Pearl St. ♦ Kalamazoo, MI ♦ 49007 ♦ (616) 343-4401
Scott Shields	4309 Drowfield Dr. ♦ Trotwood, OH ♦ 45426-1917 ♦ (513) 837-4165
Rod Smith (7)	730 Cline St. ♦ Frankfort, KY ♦ 40601
Bob & Connie Trembley (56)	11542 Roxbury ♦ Detroit, MI ♦ 48224 ♦ (313) 526-0747
Kiran Wagle (54)	4924 N. Washington Blvd. ♦ Indianapolis, IN ♦ 46205 ♦ (317) 283-5193
Guy Wicker (32)	30437 Fairfax ♦ Southfield, MI ♦ 48076 ♦ (313) 647-1820
Rolf Wilson (28)	611 W. Hill ♦ Champaign, IL ♦ 61820 ♦ (217) ELYSIUM

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active

inactive

June 1979

- | | |
|--------------------------------------|------------------------|
| | 1 - Keith Thorne |
| | 2 - Mike Sestak |
| 4 - Renee Sieber / Marty Franz | 3 - Mike Bentley |
| | 5 - Alice Bentley |
| 7 - Rod Smith | 6 - Dick Smith |
| | 8 - Steve Johnson |
| 10 - (Tullio Proni) | 9 - Bill Colsher |
| 11 - Greg Ruffa | |
| | 12 - Gordon Garb |
| 13 - Valli Hoski / Joachim Schürmann | 14 - Clyde Jones |
| | 15 - Angel Insley |
| | 16 - Alex Ellingsen |
| 17 - Bill Higgins | |
| 18 - Jamie Hanrahan | 20 - Doug van Dorn |
| 19 - Donna Proni / Tullio Proni | 21 - Bill Leininger |
| | 22 - Mary Lynn Skirvin |
| | 23 - Kevin Dunn |
| | 24 - Kip Williams |
| 25 - (Marty Franz) | |
| 26 - Dave Levine | 27 - Bill Roper |
| 28 - Rolf Wilson | |

June 1980

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| 29 - Dave Powell / Susannah West | 30 - Gretchen van Dorn |
| | 31 - Robert Osband |
| 32 - Guy Wicker | 33 - Martha Soukup |
| | 34 - Jon Singer |
| | 35 - Gerald Corrigan |
| | 36 - Paul Gadzikowski |
| | 37 - Jeff Sekiya |

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| 39 - John Frambach |
| 40 - Clif Flynt |
| 41 - Gail Hanrahan |

June 1982

- 42 - Andy Anda / Annette Kavanaugh
- 43 - Bonnie Jones
- 44 - Hugh Daniel

June 1983

- 45 - Sam Paris
- 46 - Charles Galway
- 47 - Guy Consolmagno

June 1984

- 48 - Roxanne Meida-Shields
- 49 - Nikki Ballard
- 50 - Dean Anton Sherwood
- 51 - Linda Struwe-Matsushita

June 1985

- 52 - Sheila Groves
- 53 - Eric Roman Nash
- 54 - Kiran Wagle
- 55 - Barry Gehm
- 56 - Bob and Connie Trembley
- 57 - Steve Salaba

June 1986

- 58 - Lee Hart
- 59 - John Hall
- 60 - Scott Shields

*** The Generic Engineer ***

Drat. My first contribution to APA-Tech, and I haven't the faintest idea of what to write about. Worse yet, I don't know how to write nothing and make it look like something.

Should I start like everybody else does, by answering other people's questions in a fashion completely impenetrable to the casual reader?

Barry: Next time, I'll have plenty of Wintergreen lifesavers

Sheila: Yes

Donna: No

Tullio: You've got to be kidding

George: It's crackers if a mouse that spins

Bill: I did, she did, they did, and we're still looking

Mike: 300789 60FE

Alice: 30078B 60FC

MacDonald: No, I don't think the rubber will seal in cold weather

Naa, that's no good. A month from now even I won't remember the questions (I was never any good at Jeopardy). So how about if I say something about myself?

An engineer techie named Lee
has a business that won't let him be.
He fights day and night
With computers that byte.
Who's the boss around here, them or me?

I'm the guy who has a business in his basement and a pain in his ass, both of which are named TMSI (Technical Micro Systems, Inc.). I started the company in 1979, and watched half a million dollars go through the books without being clever enough to keep any of it.

TMSI is my sole source of employment, which is only fair because I'm its only employee; we keep each other alive. I'm not sure if the arrangement is parasitic or symbiotic, but I'm sure of this: Anyone who starts his own business has two strikes against him; a slave driver for a boss, and a fool for an employee. But if I'm going to give advice, here's rule #1.

Rule 1: If you're thinking about starting your own business,
let someone who did try to talk you out of it.

Corollary to Rule 1: Anyone with a big enough ego to start his own business won't listen to anyone else's advice.

It does have its fun points, though. I do custom engineering to turn people's nutty ideas into reality. Right now I'm working with a company that designed a 3-D projector and camera. These people are mechanically oriented; they don't know you need lasers, holograms, or funny glasses to display 3-dimensional images. And they don't know it takes megabytes of RAM and CRAY super-computers to manipulate images.

* This engineer may contain minor defects in ability or judgement, but should be suitable for occasional use in shuttle booster design, SDI systems, and other non-critical applications.

So they built an interociter (if anything deserves the name, this thing does). There's a camera and a projector; I'm working with the projector portion, which is called "SAM". It displays a 3-D image of an object in full color. No glasses are needed, and any number of people can view it simultaneously. You can rotate the object a full 360°, enlarge or reduce it, and (get this), section the object through any plane and view its internal structure.

The prototype is about 3 feet tall, and looks like the top half of Robbie the robot. The black base is roughly cubical, but has so many knobs, wheels, levers, and protrusions that it's hard to describe. On top is a hemispheric plexiglass dome about 16" across in which the image appears, suspended in space. Inside are enough optics to build a dozen Nikons. Oh yes, it has 1 motor, 1 flash tube, and two relays; that's the extent of its "electronics".

They plan to use it as a display device for a CAT scanner. For instance, a doctor could take a scan of your head, and then view a full-size 3D image of it. He could then cut sections through your brain to look for tumors, and find the best way to reach them (much neater than a chain saw).

My job is to make the gadget electronically controllable. They want digital readouts and keypads to control it, instead of the jungle of lenses, mirrors, etc. they have now. It's amazing what can be done if you don't know it's impossible!

They Don't Make 'em Like They Used To

We're used to thinking that electronics technology gets better all the time. Every day we push back the barriers of the impossible, right? Well I ran into a place where the impossible is reclaiming old ground.

Specifically, it's in analog electronics. Colleges are pushing digital design almost to the exclusion of all else. Very few graduates go into control systems, radio frequency, power engineering, or analog design.

A manufacturer needed to update their picoammeter design. The original product has been in production for 10 years, but they had to stop because they couldn't get the parts anymore. I was hired to re-design the product using modern parts.

The original instrument had an input amplifier good to 10 femtoamps; that's 0.000000000000001 amperes, or 62,421 electrons per second. It sold for \$70, and was made by 2 firms (Analog Devices and Burr-Brown). I learned that they couldn't make these parts any more, because it involved delicately balanced discrete analog circuitry. The guys who built them had retired, and they couldn't find younger people willing (or able) to do it.

They now have a new line of parts, fabricated as monolithic integrated circuits. They are smaller, cheaper, and take less power than the old parts - but don't work as well. I called a dozen manufacturers, and it was all the same: We can't do it no more. I had to settle for a part good for only 40 fA.

It's one thing for a technology to be superseded by something better; it's quite another to abandon it because it isn't "fashionable" or "high tech" any more. For instance, you still can't beat vacuum tubes

for some applications (TV displays, high-power transmitters, microwave ovens); yet there isn't a single vacuum tube plant left in the US.

I place much of the blame on our universities. It used to be an engineering education was pretty generalized. Regardless of your major, you got at least an introduction to mechanical, chemical, civil, electrical; the whole bit. I can remember studying electrical engineering at Michigan Tech, and moaning about having to study pre-stressed concrete design. But it turns out that mechanical stress patterns in concrete are very similar to thermal stress patterns in an integrated circuit. By gum, it WAS relevant!

But when I talk to graduate engineers from U of M today, it's completely changed. They're turning them out like rabbits. Each one is a specialist and highly theoretical. They have exactly one solution for every problem, and it is the RIGHT solution. They haven't a hint as to the practical problems that reality may impose. They don't know what a resistor look like; hell, they don't even know a resistor gets hot! (though they could derive it from first principles). It's no wonder companies can't find anyone to make creative designs that actually work.

These are the people we trust to build super-reliable star wars systems? I don't even trust them to build a light dimmer that works thru a thunderstorm!

And on Over-Reliance on Technology

It's no secret that our armed forces put a great deal of faith in technology. In light of recent events with the "Stark", I thought I'd pass on some comments from my cousin. He's in the Navy, in Fire Direction Control on board one of the big carriers, and took part in the raid on Lybia's God-daffy.

Their ship has the AEGIS electronic defense shield. AEGIS locates and targets all incoming objects, and shoots them down. Its response time and accuracy are so great that it can shoot down incoming artillery shells before they reach the ship. Yet AEGIS is never engaged; not even during the Libyan raid. Why?

Reliability, for one. AEGIS is so complex that most of the time it's dead or flaky. Second, it's trigger happy. When AEGIS sees an incoming missile, it blasts it to pieces. Then it sees the pieces approaching the ship, and blasts each piece. This provides even more pieces to shoot at, until it either runs out of ammo or the pieces are too small to see on radar. Third, it goes Rambo; it blasts every fishing boat, seagull, and dorsal fin in sight if it doesn't get the correct recognition signal. It'll gun down your own wounded just to make sure the ship is safe.

I write this on May 19, before all the facts are out on the Stark incident. But I betcha a) the Stark had high-tech radar and automatic weapons systems that could have stopped the missile, b) the radar was down for repair or flaky, and c) the automatic weapons were off anyway, because it would attack friend and foe alike.

Enough of this tripe. Bill: Here's the song/dance/drink/place that Cary Cornett asked me to pass on to you. It's rough, but I like the idea and got a chuckle out of it.

THE TOPOLOGICAL TWIST by Cary Cornett

It used to be the Molecular Club
Just one flight down from the heat.
The best booth had a window
With a worm's eye view of the street.
Alas, it soon went bankrupt,
But it will not be missed
For now it has re-opened as
the Topological Twist.

To enter through the doorway,
You have to pass this test.
You can't take off your jacket
But you must remove your vest.
Your host will frown his welcome,
Be careful not to grin
'Cause if you make him mad enough
The bouncer throws you in.

Now order old Klein's bottle,
the one with no inside.
The drinks are free if you pour your own,
though many men have tried.
So the barmaid pours a glass for you
With such an agile wrist
The drink is known around here as
The Topological Twist.

Let's hit that crazy dance floor
And dance the Moebius craze.
Wait! How'd we reach the ceiling?
(Wouldn't Escher be amazed).
Your left foot climbs the stairway,
My right foot goes like this.
See, it's easy when you're doing
The Topological Twist.

Your inner ear's been drinking
Your eyes have flipped their lid.
Your mind says it can't happen
But your senses say it did.
You'll never see it's like again
It really can't be missed
So I'll have to meet you yesterday
at The Topological Twist.

Re: ragged right margins. Even though I wrote this on a word
processor, I couldn't justify any of it.

Lee Hart
366 Cloverdale
Ann Arbor, MI 48105
(313) 994-0784

"Life's Been Good To Me So Far..."

A contribution to ApaTech #52, June 1987, by (please note change of address):

Roxanne Meida Shields
410 S. Pearl Street
Kalamazoo, MI 49007
(616) 343-4401

"Every time I decide on taking action, I run through the possible results to try to rationally decide on the best thing to do, but I am finding that all decisions are a two-edged sword, that any action may both benefit me and harm me. In the final analysis, everything is a gamble."

-Steven Callahan
Adrift

Scott and I have permanently parted ways, as most of you already know. He is still living at the same address in Dayton/Trotwood. I have moved to the above address in Kalamazoo.

My life here has fallen into place with remarkable, incredible ease. I found this apartment in two days of serious looking. It is near Isher, 3-and-a-half rooms as they would say in New York, I was unable to move in as soon as I would have liked because they were repainting and putting in new carpeting (!), and generally it went very well.

My job hunting went about the same. Renee Sieber was going to see a client of hers, and offered to drop off a copy of my resume, since her client was manager of the local E.F. Hutton office. This was on Tuesday. Wednesday evening he called. There were no openings at E.F. Hutton, but would I be interested in working for his church on a temporary basis for 3 to 6 weeks? Sure, said I. I went to a meeting with their board on Thursday, and was set to start--on a temporary basis--on Monday.

On Monday, "fresh" from Minicon, I showed up to have the current bookkeeper, Gayle, show me what to do. By 11:00 it was clear that I knew a whole lot more about what she was doing than she did. She was doing it all from memory and put-number-X-in-slot-Y. Fine. On Wednesday she went off for her surgery. That afternoon, the de-facto Office Manager, Lucy, came to see me. It turned out that Gayle really didn't want to be the bookkeeper. Gayle was trained in Gerontology, and really wanted to do social programs for the older members of the congregation. She was just keeping the books because there was no one else to do it. If, and she stressed that it was a big if, if they could get it by the board, would I consider taking the position full time. I said, Sure, but there were certain wage requirements that would have to be met. I didn't really expect a church to be able to do that sort of budget expansion on short notice. Little did I know. They offered enough money, I accepted, and I became a full-time church bookkeeper on May 1.

It is really a great position. I am essentially my own boss. As long as I do the reports correctly and don't obviously mess up, I have no one looking over my shoulder. The hours are a pretty inflexible 9-12 and 1-5 Monday through Friday, but getting Friday afternoon off isn't hard if I come in on a Saturday to make up for it. The church is three blocks from my apartment, so I walk on days that I don't have to go to the bank. And the pay is enough. You can't beat it with a stick, if I may say so.

This has left my weekends free, and I have been playing as a result. As previously mentioned, I went to Minicon. This was my first convention since WorldCon, and the first without Scott since ConFusion in

1983. I rode up with Marty, Mike and Alice, and that general convoy. We made good time and got to the convention by 5:30 on Friday despite having Scott Truesdale's fuel pump die 30 miles east of Minneapolis. I saw more people that I hadn't seen in years: A sizable number of all the PFRC'ers ever were in attendance (an unofficial count said something like 60 in all), plus a lot of GT, plus midwest fandom in general.

I was astonished at how many people I actually knew. And how many didn't recognize me. My hair has been its natural color since 1983, but I felt I should be wearing a badge saying, "Yes, my hair used to be a different color, and I wear glasses now." Sigh. It was lots of fun. I didn't get enough sleep, enough to eat, or enough talking done, but I tried.

The next week was the HamFest. I hope everyone else had a good time. I spent the time packing and loading my car, the U-Haul, Barry's car and Mike's 4-Runner with most of my worldly belongings. Thanks, everybody, for putting up with it. It was a strain on me, but I got through it. Thanks, Marty. Thanks, Mike. Thanks, Barry. Thanks, Alice. I couldn't have done it without you.

Two weeks later, Donna, Tullio and I went on the spur of the moment over to see Bob, Connie and Rachel in Detroit. Bob, Guy Wicker and I crashed (i.e. we didn't buy memberships) Contradiction that was being held in Southfield. That was fun too, even though we only stayed about two hours. It was a surprisingly nice little convention. I may go for real next year; we'll see.

The next week, I gave in to temptation and went to Washington D.C. for the weekend. The Air & Space Museum is a lot of fun, but the Air Force Museum in Dayton would be better to spend an afternoon in. The displays are better in Dayton, and there aren't as many people. Plus in Dayton you get an occasional plane from Wright-Patterson Air Force Base cruising by. They don't have that in Washington, nor do they have the big modern fighters on display. The Lincoln Memorial looks just like the pictures. The Vietnam memorial is eerie. At first it just looks like a nice granite wall, but then you start reading the names, and the names, and the names. It is more eerie because no ranks or services are listed.

I was most impressed with the Jefferson Memorial. Of all the Presidents, I think I would most like to talk with him. After all, he was the principal author of both the Declaration of Independence and the U.S. Constitution. I bet most authors would give a lot to list those documents on their bibliographies. Plus it is in the prettiest setting, being right next to the Tidal Basin.

That pretty much brings us up to date. On to Mailing Comments on Issue #50:

Cover: Can we get a heavier stock of paper from now on?

555 Times: Very nice.

Dr. Gonzo's: Back to reality with ditto. It's nice to see that someone can still put out an apazine without using a photocopier.// Have fun bouncing around the world. I'll miss seeing you around here.

Crumbcrunchers: I'm sorry that it came across that I was opposed to children. I'm not. As we become older, children will be an increasing part of our lives, and we, as fairly childish adults, must learn how to behave around children who are children in age and experience as well as mind. By establishing the ground rules early, we will save many years of hurt feelings and problems. At least I hope so. Only time will tell how it works out in practice.

Uncle Bear: I'm jealous. Scott and I took ground school the last term he was at Tech, but now there is very little chance that I will actually learn to fly. Oh, well. It was one of the sacrifices, you know. //As to Federal Express, a similar situation takes place in Dayton with Emery every night. Some of my co-workers at Shawmut had night jobs at Emery. I couldn't do it, not for months on end like they did. But their weekends made up for it: It wasn't unusual for them to fly to Boston or Baltimore for Saturday, and back on Sunday. You can do that when you're earning two good incomes, and your spouse works too.//On sleep--when I'm tired I can sleep anywhere. World War III could go on in the same room; I'll be oblivious. On the other hand, at conventions where I want to be awake, it can be very difficult for me to sleep past 8 or 9 am. Even if I just went to bed at 5. It has also happened that I stayed up all night, only barely dragged myself through 5 and 6 am, but was just fine once the sun came up (until it went down again).

...Albuquerque: Frankly, no, I wouldn't buy that vehicle. I don't really understand why Sam did. And you displayed great courage in agreeing to accompany him across the country in it.

Fractal Realities: I think you must work at getting your spelling and grammar to come out like that, and I'm very proud of your doing such a fine job of it. As for the small package in orbit (I assume my Self wouldn't qualify), I just want access to the cameras and communications equipment that are already there. That would keep me busy for years, just looking at the pretty pictures, and calling my friends to tell them about it.

Borborygmus: I primarily like SDI because it will keep an increasingly large number of my friends, relatives and acquaintances off of the welfare rolls, and at a fairly high standard of living. As long as the Dept. of Defense has to have a Project in order to keep funding research, I will support that Project until it seems that people are going to start dying from it in the very near future. We ultimately gain an awful lot in standard of living whenever the government starts researching something. I would rather they spend more time on the space station, but if they have to call it SDI in order to do it, fine. Government labels are always tenuous at best, and even the past can be changed. And whatever they plot to do won't be the final outcome anyway. I would rather my tax dollars went to researching satellites than funding more welfare children anyway. Sorry, but that's just me. No one else has to (or should necessarily) agree with me.

"...Idiots...": Calvin and Hobbes has certainly taken GT and fandom by storm. I think Watherson has captured the essence of many of our childhoods (or what we wish our childhoods had been).

...Gadget-Mad Yupple: If the shoe fits, wear it.//I am again stealing time on Alex's Mac until (hell freezes over) I can afford my own.//My own reaction to colorization is pretty blah: If they want to spend zillions of dollars employing people to do it, fine. Any of the movies they do it to, I will watch on my TV, and it is much easier to get it to eliminate color than vice versa. If your TV is better than mine, just turn the color down. Voile; good old black'n'white. //When I am writing longhand, I make all sorts of "typos" that I don't when typing. Don't judge my spelling ability by my longhand.

...Interesting Times...: I hope I wasn't too much of a burden. I owe you and Tullio a lot for putting up with me for so long. Thank you.

Amorphous Abstractions: How do you feel about Canon's acquisition of 7% of ECD? //Good luck with the semiconductors.//I think the problem with the current incarnation of PFRC is that they are still 18 to 21 and I'm not anymore. Being around them at Minicon showed me just how much I have matured, even if it doesn't seem like it sometimes.

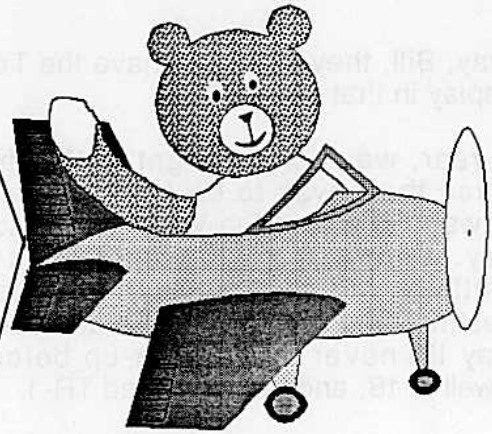
Incorrect Thoughts: Why wouldn't the force of the Estes rocket get lost in the atmosphere? Or is this a consideration I should ignore? Thanks, again, by the way.

"These are the Days of Miracle and Wonder": No kidding. Did you read about how I got my job?//Southern California/San Diego sounds wonderful. Why didn't you go to Sea World?

...Franz Ferdinand...: Ditto my comment to Steve. Someday I'll have to do a tour of Chicago bookstores using your list. It should be a great afternoon...//By inconsistent babysitters I mean that they will allow the child to do something one time, and then not the next. This confuses the child. Also, the babysitter will use inconsistent reward/punishment. Good babysitting takes practice, and most over-18-year-olds are out of practice.

Transporter Topics: The children of America are burdened by the fact that their teachers and parents are not good at teaching, and each is assuming the other is teaching the child. This allows the smart child to learn whatever and whenever he wants, or not. The outcome is generally yet to be determined. There are successful people from repressed households, and unsuccessful people from very open households.

UNCLE BEAR'S **AERONAUTICAL ADVENTURES**



Uncle Bear #3 - for publication in APA-TECH

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I'm Flying

My flying lessons are going well, and I'm having a lot of fun. Although I try to fly twice a week, I have only accumulated about 12 hours due to weather, vacation, and other problems. The law says I must have 40 hours before I can take the exam, in fact most people have 50-60 hours before their flight instructor will sign them off as proficient. It looks like this will keep me busy for the rest of the summer.

I have already learned all of the basics. I can take-off, fly around, and land by myself. Doing it *well* will come in time. Also, I have so far only flown around the airport here in Rochester. Cross-country flights to remote destinations come later in the training.

I have already survived one in-flight mishap. The plane's alternator died on take-off, just as we lifted off the ground. The ammeter went negative and warning lights came on. Fortunately, reciprocating aircraft engines get their spark from magnetos (two, for

redundancy), and so do not need either battery or alternator power to fly. The alternator/battery system runs the starter, lights, and radios. We called the tower quickly (since we didn't know how long the radio would last), and brought the plane around the pattern and right back down. No danger, but a little excitement.

It's funny, I thought that flying would be a lot of fun. It is, but at least while I'm learning, I'm too busy to notice. The concentration necessary to get the plane to do what I want it to do is so great that I don't have time to think about whether it's fun or not. Once I get down on the ground, then I realize how much I enjoyed it. I expect that as I develop more of the habits and reflexes of flying that I will find more time to enjoy the experience.

Washington D.C.

Joanne and I spent a week in Washington D.C. We took her sister, Michelle, with us to see the sights. We had visited the city once before, for three days before Constellation, the Worldcon in Baltimore. We found that three days wasn't enough, then, and we found that a week isn't enough either.

That first visit was notable for a serendipitous occurrence. Who do you think we ran into in the Smithsonian Museum of American History, in the "Atom Smashers" gallery, but Bill Higgins, who gave us a guided tour of the of the Fermilab main ring tunnel mock-up. By

the way, Bill, they *still* don't have the Tevatron on display in that tunnel.

This year, we rushed to get to Washington because there was to be an Open House at Andrews AFB where the Voyager was to be on display. Unfortunately, Voyager didn't show. The little bit of the air show that we saw was interesting, and they had two planes on static display I'd never seen close-up before, the Rockwell B-1B, and the Lockheed TR-1.

We saw the National Zoo. Of course we saw the pandas, and for the first time in my life, I saw Smokey the Bear. (Of course, the original Smokey died a few years back, but don't tell the kids).

Visiting the Washinton Monument, I learned that government projects weren't run any better in the last century that they are today.

I was prepared to be unimpressed by the Vietnam memorial. I'd seen pictures of it, and really didn't think it would be too much. I was wrong. It is a very effective monument. Panel after panel of black stone, each one covered with the names of the dead and missing, give a visible scale to the cost of war. Even more moving is the constant crowd of people passing along the wall, looking for names, touching the stone, and sometimes leaving a flower or a photograph wedged in a joint.

We saw Howdy Doody, Kermit the Frog, Dorothy's ruby slippers, and Archie's and Edith's chairs at the Museum of American History.

New at the Air and Space Museum is the Michelob Light Eagle man-powered airplane. We saw two Imax films "To Fly" and another one that featured the mechanical pterosaur Quetzalcoatl Northropii "QN". There were also good videos on the building, flying, and ultimately crashing of QN and on the flight of Voyager. Sad to say, the building is getting real full, and the government hasn't yet funded the proposed annex at Dulles. The Space Shuttle "Enterprise" is currently at Dulles, and I hear the Smithsonian has dibs on a Concorde when they eventually are taken out of service.

Crackpot Ideas Dept

Does Your Toothpaste Lose It's Flavor ... ?

Here's a question for you. Have you ever noticed that products like toothpaste, deodorant, and dandruff shampoo seem to lose some of their effectiveness after you have used them for a period of months or years? I have seen this happen at various times with all of these products. I change to another brand which works better ... for a while.

Now, If I'm not just imagining things, what's going on? Is my body chemistry changing? Are the "bugs" that these things are supposed to zap evolving? Do the manufacturers of these products fiddle with their potency to get people to try other brands? I just wondered.

Book Review

West with the Night Beryl Markham

Beryl Markham is (was?) a truly remarkable person. Born in England in 1902, at the age of four she and her father moved to British East Africa where her father became a farmer and horse breeder. She grew up with only the native Masai children for playmates. Later in life, she became a horse trainer, and the a bush pilot carrying mail, passengers, and supplies to the far-off corners of East Africa. In 1936 she became the first person to fly the Atlantic non-stop from east to west, from England to a crash landing in a Nova Scotia bog.

In **West with the Night** Ms. Markham describes these parts of her life. She tells us of hunting lions with the Masai, and of spotting elephant herds from the air for safaris. She tells us of her dog, Buller, who was her constant companion as a child and of Pegasus, her horse that was the only thing she had after her father's farm failed. She tells us of the people, Africans and Europeans, who she worked with, played with, shared sorrow and joy with.

This book was originally copyright in 1942, and has recently been reissued by North Point Press in 1983. My volume says that Beryl

Markham was the subject of a PBS documentary called "World Without Walls" for which I intend to keep my eyes peeled in case it comes around again.

One of the greatest treats in this book for me is the insight Ms. Markham shows, and the poetry of her language. Here's an example from chapter 15:

"After this era of great pilots is gone, as the era of great sea captains has gone -- each nudged aside by the march of inventive genius, by steel cogs and copper discs and hair-thin wires on white faces that are dumb, but speak -- it will be found, I think, that all the science of flying has been captured in the breadth of an instrument board, but not the religion of it.

"One day the stars will be as familiar to each man as the landmarks, the curves, and hills on the road that leads to his door, and one day this will be an airborne life. But by then, men will have forgotten how to fly; they will be passengers on machines whose conductors are carefully promoted to a familiarity with labelled buttons, and in whose minds knowledge of the sky and the wind and the way of weather will be extraneous as passing fiction. And the days of the clipper ships will be recalled again -- and people will wonder if clipper means ancients of the sea or ancients of the air"

Mailing Comments - APA-Tech 50

Valli -- It sound like your life is going through some interesting times. How's life in Puerto Rico? I'm glad to hear that you won't be forsaking us as you live this perpatetic life. It's going to be interesting hearing from Linda in Osaka and you in Milan. Good luck.

Dave & Susannah -- Congratulations, Dave, on getting your PE. I always feel a little guilty when Kodak tells me I'm a "Software Engineer".

Shux, I ain't no engineer, I'm a Computer Scientist. Maybe someday software engineering will be well enough established as a discipline that the states will indeed certify "Software Engineers". Of course that won't be until, for instance, we can estimate software jobs from a "Blue Book" as accurately as we can estimate,

say, earthmoving jobs today. Members of other engineering professions shouldn't be too smug though. Remember: "When Civil Engineering was forty years old, they hadn't invented the right triangle yet."

Bonnie -- You ask "Now honestly, would you buy this vehicle?" No. Your story make me wonder about Sam's judgement. As for you, I'm undecided whether you are an excellent person to have for a friend, or equally short (not a short joke) on brains. (Hmm. Rereading that, my ironic tone of voice didn't come through too well. Be assured though, it is there) That was quite an experience you had, and you told it very well.

David -- Re colorized movies: At least we still have the option of turning the COLOR knob down, to restore the original black-and white tones.

Donna: I'm still thinking about how we should do the next bomb contest. Obviously a bomb in a locked safe is no fun, but still the owner of the bomb can easily defuse it. On the other hand, requiring all the works to be out in the open is unrealistic. There should be room for challenge at several levels: Getting to the mechanism without setting it off, and once the mechanism is accessible, deactivating it safely. Of course the technique of attacking the system at an unexpected point, such as the detonators (known to aficionados as Barry's End-Run) should not be disallowed. Taking a lead from Tullio's construct, perhaps we should devise a list of standard materials, at least for any enclosures. A "real" bomb squad is likely to have diamond drills, oxy-hydrogen torches, and other esoterica available to handle armor-plated bomb works. If we say that corrugated cardboard, mailing tubes and styrofoam are "logically" tempered steel plate, iron pipe, and cast iron, since the attackers with X-Acto knives instead of diamond drills, etc. (What? You DO have an oxy-hydrogen torch? Oh.)

Marty - I agree, IBM's new machines are indeed pretty neat. They sure break the market to pieces though. My gut feeling is that nobody is really going to tie themselves into a proprietary system like the PS-2s, and that AT clones, and things like the Compaq 386 box will prevail and leave IBM holding the bag. After all

IBM has missed big before. Remember the PC jr, or the Portable? Still, I won't make any predictions. I remember how appalled I was by the conservative (dare I say obsolescent) design of the first IBM PC. I scoffed loudly, certain that the machine would go nowhere. Ah well. "If technological excellence were more important than marketing excellence we'd all be using Victor 9000's today"

Barry & Bill - "Miracle and Wonder" -- Great reporting, guys. Wish I'd been there. How long do you guys work to come up with gems like "How can they *live* like this?" -- I can see I'll have to get to San Diego some day, if only for the Air and Space museum. The XF2Y was always one of my favorite whimsical achievements. Seaplane jet fighters rank right up there with metal-clad airships, and backpack helicopters: technically interesting, but not particularly practical. Like me, I guess.

Mailing Comments - APA-Tech 51

Shalmaneser -- Yes, things are looking a little thin these days. Regarding frankings: I already pay *Aviation Week & Space Technology* big bucks (as magazines go) to mail this stuff to me; glossy and with full color pictures, yet. I don't feel it is vital for me to pay postage to see it again in black-and white photocopy.

Rolf -- Glad to hear you will be giving soaring a try. I have a woman who works for me who is into soaring. Apparently people who learn to fly powered craft are ruined and can never become truly great glider pilots. Sort of like people who learn BASIC as their first computer language I guess -- Regarding the bigger glider, It's a good thing my flight instructor is as small as she is, otherwise we'd have to use a larger plane for my lessons. You see, I have a similar (ahem) problem to yours.

Susannah - re Rochester bookshops: World-Wide News is just as it always was. It's the only place in town that gets Trade-a-Plane, in case you wondered. I haven't been by Maplewood books for a long time, but their commercial side, Total Information is a major source of obscure technical books for Kodak. I've never been to the Bryn Mawr Bookshop,

but from your description, it sounds as though I should go visit it. One more shop that you perhaps intentionally didn't mention, the Village Green Book Shop, is now in three locations, bigger, yuppie, and more expensive than ever. The upscale gifts now take up about twice the area that the books do. Ten years ago it was a fine bookstore. Sigh...

Rod - you ask "What is the origin of your beginning paraphrase?" Well, I can't ascribe it to a source, right off hand, but it goes something like *"The wonder of a dancing bear is not that it dances well, but that it dances at all."* -- Your pilot friend showed good sense to stay on the ground when the weather forecasts were bad, even though things looked OK. In fact, it's often to be even a little more pessimistic than the official forecasts. The Pilot's fourth Commandment: *"Put not thy faith in the weather prophets, for should their be no truth to their words, neither will they accompany thee to thine ancestors"*

Bonnie - I could have done without all of the yellow bullets, too. Maybe I'm just becoming an old curmudgeon...

Valli - It sounds like your assignment to Puerto Rico has worked out well for you. I'd like to visit there some day, too. -- Interesting note about your mother being unable to hear without her glasses.

Greg - Benson, Arizona, eh? Well my heart doesn't long to be there so much that I'll come out to help you investigate it, but I'd sure like to see a report on it if you manage to get by there. -- re: frankings, see my comment to Shalaneser, above. -- Good thought on the eyeglasses/state-of-mind thing. I never considered that it could have been a conditioned or learned response. Well, that's why I call it the Crackpot Ideas Department.

Well that's it for another issue of Uncle Bear. The flying bear says "Be good"

Amorphous Abstractions

Guy Wicker

We've achieved zero resistance at 168 Kelvin and Meissner effect at 270 Kelvin (30 Fahrenheit) at ECD. The material is unstable for some reason and the effect goes away in a few hours to a few days, depending on how the stuff is treated.

I spent a few days in Silicon Valley this month to discuss a business plan for my real job at Ovonic Imaging Systems. Hugh Daniel picked me up after the meeting to go to the sushi/hot tub place for the ultimate California experience. Unfortunately, his gas line chose that instant to burst and I spent the next hour getting coated with tar up to my elbows helping him fix it. No time for hot tubbing, but the sushi was great. We stopped by Howard Davidson's house for a long, interesting visit, then drove by the huge hangars at the Ames Research Center to glimpse three jets I saw there that looked remarkably like the F-19 model. Howard is working at Livermore again.

DR. TELLER or HOW I LEARNED TO LOVE SDI

When I got back to Detroit, the director emeritus of Lawrence-Livermore Labs, Edward Teller was there to see the latest superconductor developments. I was working very closely with him for a few days. When he learned that my father was a personal friend of Michigan Senator Levin, he started extensively questioning me about the man and SDI opinions in Michigan. Levin is the head of the subcommittee that is responsible for SDI and he won't allow the bill through. Teller has talked to him and finds him completely irrational. He can't perceive why an intelligent person wouldn't put national defense before everything else. I didn't bother to mention my view that the USA should engage in complete unilateral disarmament just to be nice. I simply said that Levin supports the views of his constituency, regardless of the logic behind them. Michigan won't benefit financially from SDI expenditures, and the average man on the street doesn't perceive the Soviet threat that Dr. Teller knows is imminent. The conversation then drifted back to improved superconductivity measurements and Friedhart Winterberger's book "Thermonuclear Explosive Devices" (a good read, he says, if you like fantasy). As far as my personal opinion of SDI goes, I think it's a lot better to spend money on research than on weaponry. When are we going to start spending money on peace? That's not the opinion I left him with, though. He assumed that anyone as technically oriented as I was would be a wholehearted supporter and I promised to tell Levin what I think of SDI. I'll probably be seeing him in a couple of weeks when my father comes to Detroit, which is good because I wouldn't have written.

Mailing Comments

Rod - Superconductors have two properties that make them good for computing; zero Ohms of resistance and dispersionless transmission. Computer switches all have some capacitance in them which stores electric charge when voltage is applied. If the wire going to it has resistance, a delay occurs eliminating that charge, related to $R \times C$ (the RC time constant that users of the 555 know so well). If R is zero then RC is zero. Zero time is real fast. When a voltage step is switched onto a wire, it initiates a wave of electrons that

begin to travel down the wire. This wave is normally subject to dispersion, which causes little electronic sub-ripples and has the effect of changing it from a sharp step to a gradually rising ebb. Superconducting circuit traces are dispersionless, so a voltage step on one side results in an exact step at the other side in the time of the speed of light through the medium (maybe .9 c). Since the transmission is made this perfect, an energy savings results as well and you can start to count the switching energy in kt units.

John von Neumann showed that the minimum energy required to do an operation is k (Boltzmann's constant) times time. So superconductors also do a lot toward bringing computer power consumption down to its theoretical limits. This allows 3D, densely packed circuitry to be made without the fear of meltdown that high performance computers like the Cray2 suffer today. The practical power improvement in the next decade will be a factor of 100 to 1000. The practical speed increase will be a factor of 100 to 10000, depending on how you measure it.

Superconductors also allow new electronics special effects like Josephson junction switching. This involves two superconductors that don't quite touch, but think they're touching as long as you don't exceed the limits. Once they exceed these limits, they realize their mistake and stop conducting faster than anything else known. This can be used to make the fastest known computer logic, if a myriad of problems are solved. I'm working on it at ECD. The properties of the new superconductors open a lot of possibilities, for circumventing the problems.

Valli - I want to live on a tropical island. I've often wondered why technology doesn't originate there instead of the northern climes. I've concluded that the reason is that everyone is so content that they don't need technology. I've further concluded that if I were to go to a tropical island, my productivity would rapidly approach zero and I would have effectively retired. I want to retire on a tropical island.

Mailing Comments

Ed - Superconductors have two properties that make them good for computing: zero Ohm of resistance and dispersionless transmission. Computer switches all have some capacitance in them which stores electric charge when voltage is applied. If the wire along to it has resistance, a delay occurs eliminating that charge. Related to R time $\tau = RC$ (the RC time constant that name of the RC time constant is well). If R is zero then RC is zero. Zero time is great. When a voltage step is switched onto a wire, it initiates a wave of electrons that

TRANSPORTER
TOPICS

Rodford E. Smith
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Number ~~52~~ 49(?)

THIS'N' THAT

A few months ago, during the last of the cold weather, a young female cat began hanging around my house. I started feeding her, intending to take her to the animal shelter as soon as I got her confidence. She learned to use the cat door and began eating with the other cats, but remained terrified of Taffy, my older cat. Small wonder; he weighs more than twice as much as she does. I finally took her to the shelter during lunch on a Thursday. Friday afternoon when I got home from work she was waiting for me. In fact, she seemed glad to see me. That she had found her way back is not surprising; I live within half a mile of the shelter, as the cat creeps. That she got out of the pen is. At any rate, I have named her Christine and will have her spayed soon. She is currently on feline birth control pills.

Unless I have remembered something wrong (quite possible) we celebrate the fiftieth anniversary of the first successful jet turbine aircraft engine this year. Whittle started his first bench model of the engine in 1937. It promptly ran wild and caught fire, but it proved his concept.

MarCon was fun this year, although due to hay a fever attack I crashed early both nights. My only disappointment was a t-shirt I had made of one of my Champions characters. The artist finished it late on Sunday, rushing it. Also, the paint bled. Also, I accidentally washed it with my other whites once I got back home. Oh, well. I got to talk some with Richard Tucholka, the prime mover behind Tri-Tac, Inc. I think I surprised him with the accuracy of some of my guesses about the Tehrmelern, the aliens from "Fringeworthy." There were some good costumes at the contest and in the halls. I particularly like what one young lady did for her Robin costume.

When I got back from the con I found mouse tracks in my kitchen. I was understandably upset, since with three cats I still had mice. They had soiled the skillet in the drawer under my stove, which meant washing everything in there. I pulled the drawer out so the cats could get into the space. At around four in the morning I was awakened by a noise in my kitchen. I went in and found Taffy batting a Roach Motel around the floor. I looked inside and a pair of beady black eyes looked back. I thought it was a large mouse but later found out it was a small rat. It was apparently running from Taffy and thought this little box would

be a great place to hide. It wound up terminally stuck. Over the next two days my cats also caught two mice. This is the time of year they come into houses.

The vet came by my place the other day and wound up vaccinating 9 cats. My three, a neighbor's pair, my sister's cat and her husband's, and the two belonging to a woman staying at my neighbors. He was an hour late when he got there, but was in no hurry to leave. His next stop was to put down a pony.

I have read Wildcards and like it. It certainly seems that Martin is a fan of the early issues of the Airboy comic. I have defined Golden Boy as a Champions character.

Some more strange names from Kentucky: Horsefly Hollow; Dead Horse Hollow; Gravity Station; Black Top Church Road; Rough and Tough Branch; Aflex; Cadiz; Kingdom Come State Park.

MAILING COMMENTS

Shal: Frankings are okay, except that I already get Aviation Leak. The others were interesting. *

Rolf: It wasn't the method of teaching reading that upset me but the fact that the parents were ordering the professionals to change their methods without discussion. * Gee, I wish somebody would give me a 14" bandsaw. * As a fellow backache sufferer I have tried various remedies over the years. Water beds are a welcome relief. Lately I have been using a special exercise which really helps. You lie on your stomach and arch upwards, raising your head and shoulders and legs. Do this ten or twenty times twice a day. This strengthens your back muscles. Even if your back is already hurting this exercise will help, since it will stretch and relax tight, spasming muscles. * My furnace has two fuses mounted on it, one for the blower and one for the humidifier. * Your car hunting story reminds me of a friend who had a salesman literally stuff him into a compact. They had to remove the seat to get him out. * Don't talk to me about the vagaries of surveying. I could tell you some real horror stories! Have you ever noticed the two kinks in the southern border of Kentucky? Surveyor error. *

Crumbcrunchers: I have a variety of clamps in my workshop but still wind up using my hands as often as not. * My niece is nearly two and is just starting to toilet train. *

Bitten Bullets: Your objections to mock combat are similar to mine. Because the toys are "harmless" people get careless. *

Dr. Gonzo: Life's a beach, eh? Concerning exercise, the hardest part is getting started. Once you have the habit, continuing is pretty easy, although you still have to be careful about slacking off "just this once." *

Page Filler: According to a nationally copywrited news story in a local paper, several companies, such as Pacific American Launch Systems, tried to buy up Saturn parts, especially the F-1 engines, right after the Challenger disaster. They found seven engines in flight capable status, but had to cancel their plans

when "bigger companies" entered the market. * Actually, filming in black and white nowadays can be more expensive, since the industry is geared for color. I'm not sure they even make B&W film in commercial sizes any more. * The solar dump proposal was made tounge in cheek as an effort to stimulate other people to make suggestions. *

Amorphous Guy: There was an article in the Lexington paper about how UK researchers were studying one area of superconductivity. * I had a college physics instructor who could not make an electrical phenomena demonstration in class without shocking himself. * Re. Yr. Cmmt. Greg & Guy: That observatory sounds like the sort if thing I would buy if I won ten million dollars. *

Someone mentioned a reference for world building, but I can't fine the R\$^*!R@ thing! Can whoever it was reprise?

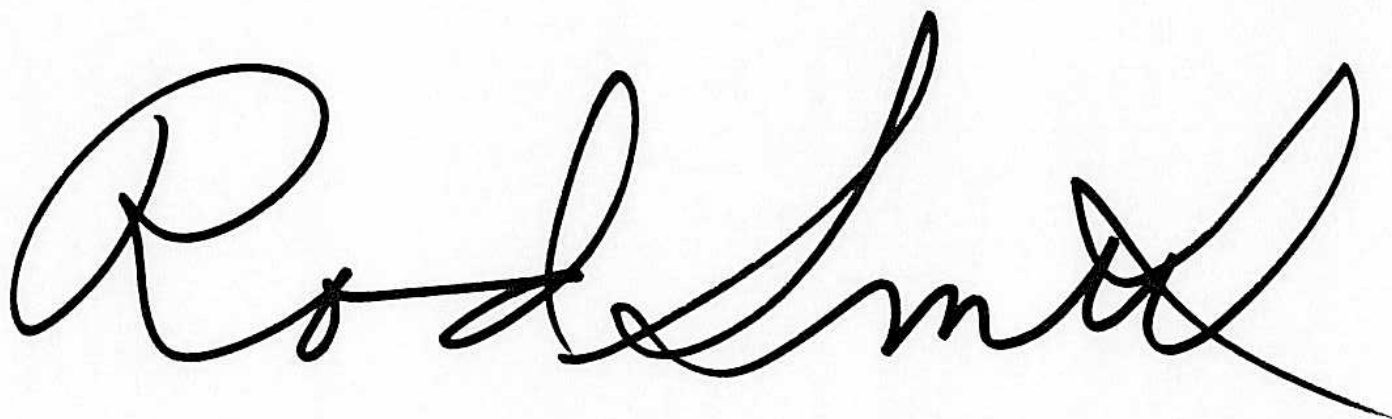
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CODA

Not a lot this issue. More next time. See ya!



CRUMBCRUNCHERS, INC.

Dave Powell and Susannah West

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May 29, 1987

Time is fleeting, so it's time for me to sit down and write a little something to you all, before June 1 sneaks up on me unawares! I think we are gradually joining the ranks of the "gadget mad yuppies," (apologies, Dave, for stealing your title!) as we just acquired a VCR (it displaced the paper cutter, which I still haven't figured out where to put). In addition, Dave, who has been pining for a digitizer, just bought MacVision. He and a friend who owns an arsenal of video equipment, spent all yesterday evening experimenting with it.

So many computer magazines have been coming and going lately. I remember quoting what I thought was an almost unbelievable figure in our now-defunct "computer newsletter" of the magazines that folded in 1985. (Can't remember what it was, but at the time I thought it almost surprising that there were that many computer magazines around!) Another magazine that's apparently joined those ranks is PC COMPANION, for Tandy 2000 users. I received four or five issues, and then it seemed to vanish. I never saw it on any newsstands, and my letters and phone calls of inquiry/complaint produced zilch as far as results were concerned.

MACUSER and PUBLISH! are apparently going strong, since being acquired by Ziff-Davis. But in the process, they seem to have lost the quality that got us interested in the magazines in the first place! PUBLISH! used to be DESKTOP PUBLISHING. Originally, its appeal was that it was written and published by people who were in the forefront of the desktop publishing field, but who still were "just folks." The attitude the editors passed on to us, at any rate, was one of "Wow, if they can do it, so can we."

Now, though, they're so professional and slick -- it's almost as if the people part got lost. I'm trying to decide if I should renew our subscription to PUBLISH!, especially as it seems to be leaning more to PC desktop publishing, as opposed to Mac. (Another magazine we're receiving, and I have no idea why, as I know I never subscribed, is PC PUBLISHING, a desktop publishing magazine for PC and PC-compatible users.)

Are there movements afoot elsewhere to make English our "official language"? I noticed a few weeks ago an editorial in the local paper written by our State Senator, informing his constituents that he'd introduced a bill to make English the official language of Ohio. He was obviously grumped that Governor Celeste and the Ohio Commission on Spanish Speaking Affairs had voiced their opposition. He then spent several paragraphs defending his position, of course. I felt that his statement that "declaring English the official language does not infringe on people's right to order from a French menu, yell at

your children in Chinese, or congregate as ethnic groups" was really evading the true issue. (I realize that sentence is grammatically incorrect, but that's a direct quote.) I haven't heard anymore about this; it will be interesting to see what develops.

I just finished reading The Good News About Depression by Mark Gold. The author is a proponent of the subset of psychiatry which he calls "biopsychiatry." Biopsychiatry implies that a psychiatrist run tests on his/her patients who are apparently depressed, to find out if they actually are. There are an amazing number of diseases, nutritional deficiencies, allergies, etc., which produce symptoms that on the surface mimic depression.

According to the author, however, too many psychiatrists make diagnoses based simply on what they hear and on outward physical appearance. For example, this is what I heard, "Of course I can tell you're depressed. I can tell by looking at your eyes." Though I had an EKG and X-rays, the only other tests I had were blood tests to check my blood levels after I started taking anti-depressant medication....Fortunately for me, this diagnosis was accurate - and if somebody hadn't made it, I might very well not be alive today....But reading a book like this can really stir up anger and bring back memories you prefer not to touch too often.

Well, I see that there are only about 15 minutes left to "Sesame Street," so I'd better get on to mailing comments!

555 Times: Like the index of cover art. I recently discovered a copy of #2 in a box of Dave's college notes, tests, etc. (He seems to have saved practically everything related to his college career, whereas I threw out almost everything except textbooks.) It has faded almost to illegibility; I'm not sure whether it was originally very light, or whether it got faded by the sunlight at one time or another.

DONNA: How much do you charge for refilling toner cartridges? I've seen several ads in the BCS publications, and realize that we'll have to be thinking about getting a refill or purchasing a new cartridge one of these days. (Dave renamed his LaserWriter at work. Now when it prints out the test sheet, instead of saying "LaserWriter" it says "RALPH.")

ROLF: In your opinion, does a waterbed help alleviate back pain? I can't decide if it does or doesn't, even though I've been sleeping on one for three years. I always wake up with a stiff back no matter where or what I sleep on, it seems. Though I injured my back several years ago, by crashing into a concrete bridge while riding my bicycle, and have accepted back pain as part of my life, it just doesn't seem fair somehow!

ROD (and JOHN, too): The most common plaintive query you'll hear from Dave is "Where are my eyeballs?" (meaning his glasses). This is followed closely by "Where is my ring?" and "Where is my wallet?" I don't know why it is that people can't put their glasses down in a consistent place when they take them off, but this seems to be a

universal problem. I waste a lot of morning time at least once a week, searching for mine. If I'm lucky, I can find an old pair which enable me to see well enough to see where the glasses I'm looking for are! I've seen these key chains that beep when you clap your hands - beepers for glasses wouldn't be such a bad idea either. (Other things I'd like are glasses windshield wipers and defrosters.)

VALLI: Ah, we have a difference of opinion regarding Puerto Rican coffee. Dave says it's the most delicious coffee in the world! (I, of course, can only go on others' say-so, as I don't drink much coffee myself.)

GREG: I like the frankings, though it may take us awhile to read them. They make me yearn for NEW SCIENTIST - I let our subscription (which was \$95/year three years ago) expire. It seemed like an extravagance at the time, when we were covered over with doctor bills and assorted baby expenses, but it also helped me keep in touch with what was going on in the scientific world.

Dave got really excited by your comments to him - "At last!" he exclaimed. "Somebody who wants to talk seriously." Agreeing or disagreeing with one's ideas here isn't as important as initiating a discussion and keeping it going.

I see I have space to write a bit more. We have a visitor spending some time with us - Kiran! He called the other evening to say he was going to be in Cincinnati and thought he'd drop by. So far, we've had a delightful time. We devoured steaks and broccoli pie (rather like spanakopita, but made with broccoli instead of spinach) last night; then he and Dave left for a tour of the power station. I went to bed, so don't know what time they got in, but it was after midnight, and sounds as if it was some tour!

Today, we've talked about books and bookshops and eaten lunch (after removing Marlene, who'd fallen asleep on the kitchen table). He is currently having a tremendous time with the Mac and ReadySetGo.

Marlene's current fascination is a board swing which we have hanging from the big ash-leaved maple in our backyard. So fascinated is she that she's completely forgotten the remote-controlled cars Dave bought at HamFest. The minute she gets up she wants to go out and swing, and she'll spend all day either swinging herself or demanding that somebody else swing her. Originally I'd gotten the swing as a present for her third birthday, but as her birthday isn't until the end of July, thought it would be best to put it up now, so she can get as much goodie as possible.

The "why" questions have started; up to this point, most of her questions were prefaced by "what." The most-often asked question comes in response to my saying, "Don't do that" (or something similar). This elicits a little scowl and a "Why you say dat?"

Whoops! End of the page! Be well and happy.

Susannah

600 Megawatts in one place!

for APATECH 51

© Kiran S Wagle

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I had asked for several days off for the Brandeis book sale, but hadn't bothered to find out when the sale was. Not wanting to waste three days off in a row, I decided to go to Cincinnati and Louisville to visit friends and do research for the bookstore guide.... Since last ish Susannah stated that "We LOVE to have visitors!", and Ripley is almost on the way from Louisville to Cincinnati, I decided to take her up on the implied invitation. The drive from Cincinnati to Ripley is quite pleasant. The road winds along the river through towns with such picturesque names as Moscow, Felicity, and Utopia. The towns themselves are too small to see. Ripley, however, has two stop lights! When I called on the 'phone, Dave offered to give me a tour of the power station at which he works. Somewhat dubiously, ["well, if there's anything to see..."] I agreed. It was quite an experience. Us pencil-and-paper theoretical physicists don't really have a handle on worldly affairs. 600 megawatts, that's 6×10^8 Joules each second.... Hmmmm.... That's a lot of Joules! Each of the plant's four generators has that capacity. The technologies and energies involved in generating electricity for this little Mac boggled my mind. Water/steam at high temperatures and pressures, purified and de-oxygenated, coal ground into fine dust, furnaces running at 2200°, hydrogen being used as a coolant, barges unloaded at the rate of one per hour.... how can beings of mere flesh and blood harness such vast forces? Needless to say, I was impressed.

On to more mundane stuff. If all goes as planned, I will be graduated from Butler University in December. I am soliciting recommendations for gradual schools with strong programs in topology, algebra, and category theory (and/or related subjects such as algebraic topology); as well as schools strong in theoretical or mathematical physics. Thanks! I hope not to move too far away, but there are several good schools in California....

The locusts/cicadas/&c. have taken over parts of Indianapolis and all of Cincinnati. This year is supposed to be at the peaks of the seven-year cycles of three related species. I have an insect phobia and this is not good for my blood pressure. Would that we had some innocuous problem like DDT instead. Here in Ripley, however, there are no locusts!

Now on to the mailing comments for APATECH 50:

Valli: Good luck in Milan!

Susannah & Dave: Congratulations. I plan to schedule minor surgery for the day of my commencement, as I despise those things. However, I first have to find some minor surgery.... Re yet Roxanne: If you want good books on childrearing, I can suggest Dr Haim Ginott's Parent and Child, Parent and Teenager, and Teacher and Child. While I have not read the books (booksellers' disclaimer) I have browsed in them and they seem to be quite good. In addition, they come well recommended by a psychologist whom I respect quite highly, Nathaniel Branden (whose books I have read).

John: Good luck in the sky. An interesting report on Federal Express. The amount of knowledge that is needed to keep modern society running is amazing. Most of a person's sensory input enters through the eyes. A fannish friend (named Lightning Bug) never needs to nap—he just closes his eyes. He "awakens" quite refreshed.

Bonnie: Where would you have gone if you had turned left at Albuquerque?

Hugh: Wonderful comments on the change of seasons and the cycle of life. How can anyone live in California?

Barry: Re SDI: A device that can stop an ICBM might be able to damage at least a high-flying 'plane as well. Remember that in Star Wars the good guys won. Because I always have too much to do and new such things are always sticking to me.

Steve: When is the surprise movie? What is the surprise movie? "The Best Looking Form of 1987," honestly, what is the world coming to?

Dave L: Colorization really does look awful. Serious photographers consider black-and-white to be a much more challenging medium

than color.

Donna: Two excellent books on romantic relationships are The Psychology of Romantic Love and What Love Asks of Us by the aforementioned Nathaniel Branden and his wife, Devers Branden. These books are chock-full of Good Stuff. Branden uses a procedure such as you describe as a form of therapy. Couples who come to him for counseling are advised to spend a day-twelve hours-alone except for each other; no kids, telephone, books, &c. His books and techniques are well worth exploring. The first is a somewhat theoretical discussion of psychology and the second a book of questions most often asked by the Brandens' clients and their answers. Good Stuff.

Roxanne: Thank you for asking—I am 22. Let's play Trivial Pursuit with Steve sometime.

Guy W: What is Ovshinsky's model for superconductivity cited in your press release?

Marty: Why would anyone want to make winters milder? The change of seasons is one of the nicer things about this planet (see my ct Hugh above, &c.). Destroying all life on earth is another matter!

Rod: ConCave is a very nice con. I was quite disappointed to have missed it this year. My con-going seems to divide in half with the winters spent up north and the summers spent in the south. Somehow this seems like the wrong way to do things.... After reading Less Than Words Can Say by Richard Mitchell, I have decided that professional educators are the lowest form of life. But ignorant parents are pretty bad too.

And now for APATECH 51....

Rolf: Thanks for the recipe! The Cambridge Buskers have the best rendition of the Halleluja Chorus from Handel's Messiah on their album Handel Bach and other Stock Baroque.

Susannah & Dave: Just be thankful you haven't been invaded with locusts—yet. Exactly what is the nature of your "uneasy truce with Christianity"? I enjoy religious music—masses, motets, organ chorale preludes, vespers and the like—a great deal. The religious impulse has produced some of the greatest music written. It is not contradictory to enjoy such music while not being religious. A good book for those considering parenthood is A Baby? Maybe by Elizabeth Whelan. It is a study of both the reasons to have (or not to have) children, as well as the

emotions surrounding said choice. It also has a discussion of the tactics and motives of the pressure groups (and individuals) which push one or the other side of the "issue"—which it is not, it is a personal choice. Dr Whelan admirably stresses this point. The book is also quite interesting for those who are interested in psychology. I bought it because I know the author's other books and ended up reading it almost immediately. If I could get a case lot of these I would give them to all my friends who were thinking of having children. My music professor was not thrilled with my enrollment, but when I demonstrated mastery of the material he said nothing more. A professor of mine likes to say that there is only one thing the humanities people hate more than a scientist who knows nothing about the humanities person's field and that is a scientist who knows everything [within reason] about the field.

Rod: I'm glad someone noticed the headline. Thanks for the tip on the Lexington bookshop.

Bonnie: I for one wish you had said something to me at Ishercon itself about the guns. I come because I enjoy having fun with my friends. I do not enjoy having fun at the expense of my friends. I can't speak for anyone but myself, but I would gladly have stopped had I known I was annoying you.

Valli: Please circulate the list as you see fit. That's what it's for!

Greg: The "physical fallacy" is used to "refute" the economic necessity of middlemen, speculators, ticket scalpers, &c. People seriously propose policy based on this fallacy seemingly every day. Another objection to CDs: When one has a collection of several thousand records, one is lucky to listen to each record once a year. As an LP has a life of at least fifty plays, one will not need to own all but one's favorite records on CD....

Guy: I got the Blue Angel mailing from the Analog mailing list. I suppose it is profitable for a fireworks company to try and sell to fans.



Measure Theory: The Heart of the Matter

Joseph Kupka

I. Origins

1. What is mathematical measure theory?

The art and science of measurement—which is the use of a number to describe the amount of some characteristic or quality possessed by an object—constitutes a cornerstone of modern science, and perhaps of all civilized society. Among the earliest qualities which were subjected to systematic measurement were *length*, *area*, and *volume*. Knowledge of the area of a plot of ground can be used to predict its crop yield or to help estimate the size of an enemy force encamped upon it.

Most ancient civilizations developed the basic idea of *units* of measurement. The Egyptian unit of length, for example, was called the *cubit*. The Egyptians lived on relatively flat expanses of ground, and it seems that they mostly subdivided their territory into rectangular plots whose areas could be expressed in whole numbers of square cubits. The ancient Greeks, on the other hand, inhabited hilly terrain with limited amounts of flat land available for agriculture. They needed to ascertain, and so to compare, the amounts of area in pre-existing, irregularly shaped plots of ground. This accident of geography, coupled with the ever-present military threat posed by the Persian hordes to the east, is held to be largely responsible for the vastly greater sophistication of Greek mathematics over that of the Egyptians. And measurement is a key feature of their mathematics, not in the modern sense of assigning a number to an object, but in the sense of establishing exact relationships between various quantities (mainly lengths and areas). Perhaps the most famous example is the " $a^2 + b^2 = c^2$ " relationship of the Pythagorean theorem. The Greeks looked upon this as the equality of two *areas*.

Mathematical measure theory is a branch of modern mathematics which deals with systematic techniques

for measuring complicated or irregular objects when the measurements of simple objects are known in advance. Its central idea has a long lineage dating back to a technique invented by the Greeks.

2. From Euclid to Archimedes: The paving stone technique

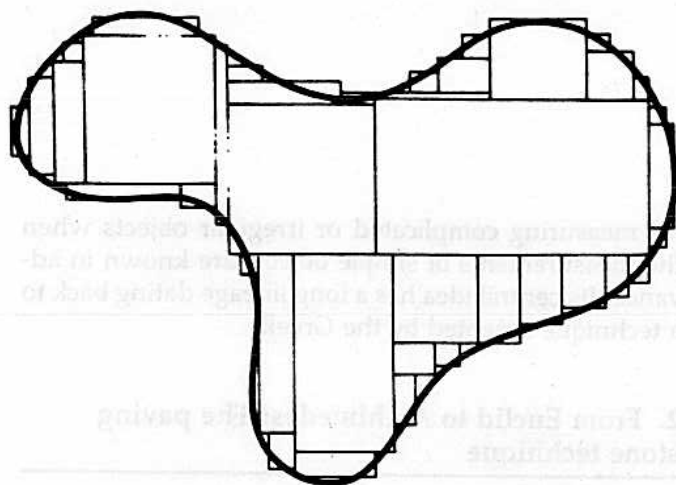
The first great mathematical treatise, Euclid's *Elements of Geometry*, was written around 300 B.C. It contains many results about the areas of *rectangles* and *triangles* (or, strictly speaking, about the regions enclosed by these figures). These were to be the "simple objects" of area measurement. To obtain the areas of more complicated regions, the Greek mathematicians employed a natural elaboration of the already ancient practice of specifying lengths or distances in terms of whole numbers of *unit* lengths (as in a "span of five cubits" or a "journey of twenty leagues"). Their idea, which we shall refer to as the "paving stone technique," was to let the simple objects stand in place of

Joseph Kupka



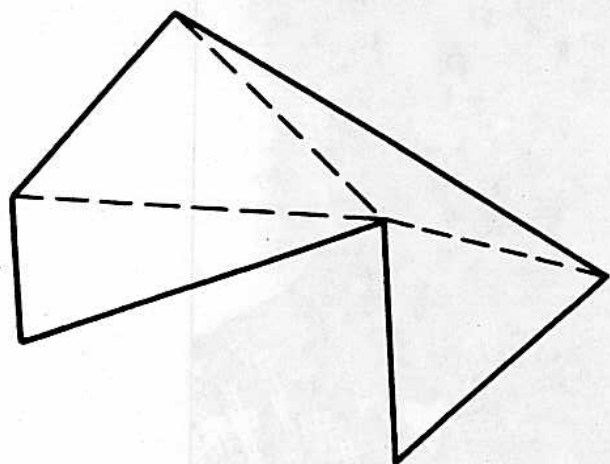
The author is indebted to Mr. Gordon Smith for much valuable advice on the early history of this subject.

the units, to treat these objects as "paving stones," and, in effect, to "pave" the given region as exactly as possible with variously chosen stones, thus:



The unknown area is then *approximately* equal to the paved area, i.e. the area which is actually covered by the stones. It was (and is) considered to be part of the intrinsic nature of area that the whole should be equal to the sum of the parts, and so the paved area, in turn, is equal to the sum of the *known* areas of the individual (nonoverlapping) stones.

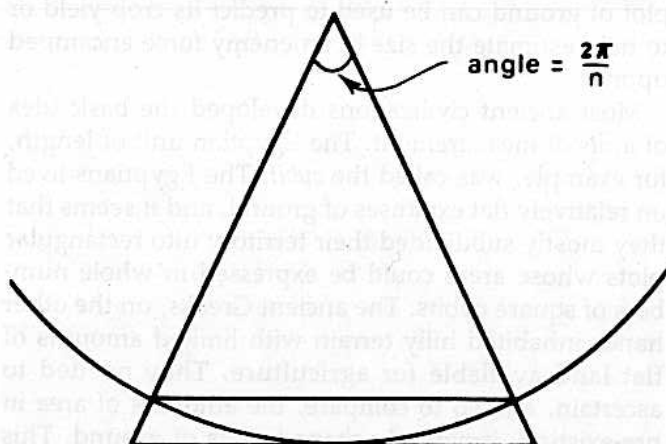
Such approximations certainly could be made precise enough to satisfy the practical requirements of the time. The greater sophistication of Greek mathematics came about because of their desire for *perfect* exactitude. Consequently the triangle gained favor over the rectangle as a paving stone because any region bounded by straight lines could always be paved *exactly* by finitely many triangles, thus:



The real ingenuity of the Greeks lay in their derivation of exact information about the areas of regions

bounded by *curved* lines. Such regions could not be exactly paved by stones which had uncurved edges. So the Greeks devised a "method of exhaustion" whereby the exact area is almost literally *squeezed* out of a great many inexact pavings. This method was their version of today's "limiting argument." It is used in Book 12 of Euclid to reveal the fact that the area of a circle lies in constant ratio to the area of the square on its radius. This famous ratio (the number π , as we know it) was later found by Archimedes to be less than $22/7$, but greater than $223/71$. We now know that π is irrational.

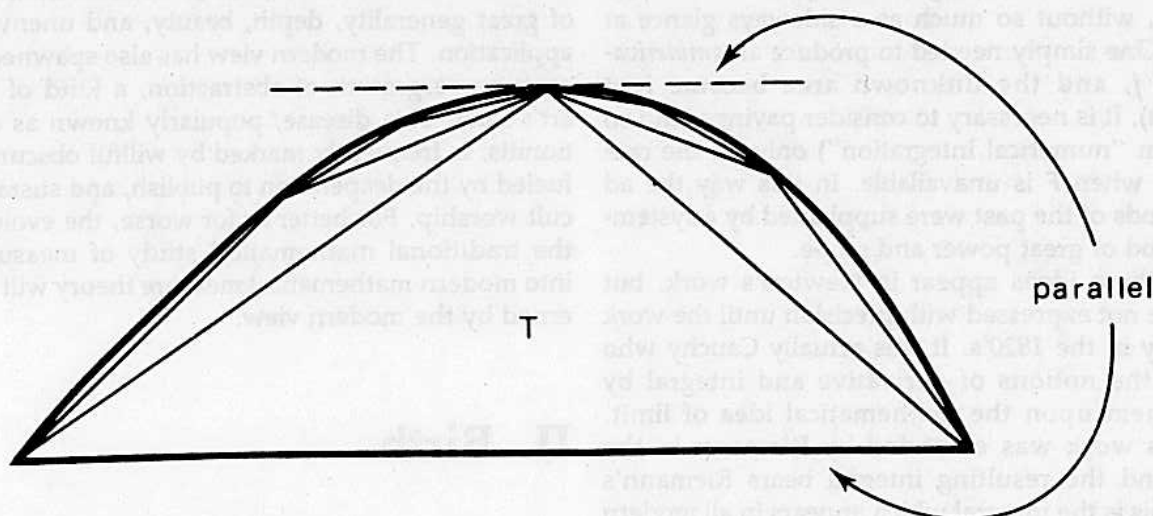
To illustrate how exact area measurements may be squeezed out of inexact pavings, we shall present a hybrid derivation of the area A of a circle in terms of its radius r . The triangulations (that is, the pavings with triangular stones) will be precisely those which Euclid considered, but the notation and limiting argument will be strictly modern. The basic idea is to subdivide the circle into an arbitrary number n of equal sectors. With each sector we associate the usual *inscribed* and *superscribed* triangles, thus:



The inscribed triangle has base $2r \sin \pi/n$, height $r \cos \pi/n$, and hence area $r^2 \sin \pi/n \cos \pi/n$. Let us consider the n inscribed triangles as a paving (an inexact triangulation of the circle). The total paved area is then $\ell_n = n r^2 \sin \pi/n \cos \pi/n$. And since the paved region lies *entirely within* the circle, it follows that $A \geq \ell_n$. Hence, in the limit:

$$A \geq \lim_{n \rightarrow \infty} \ell_n = \lim_{n \rightarrow \infty} \pi r^2 \left(\frac{\sin \frac{\pi}{n}}{\frac{\pi}{n}} \right) \cos \frac{\pi}{n} = \pi r^2.$$

The superscribed triangle has base $2r \tan \pi/n$, height r , and hence area $r^2 \tan \pi/n$. The n superscribed triangles pave a region of total area $u_n = n r^2 \tan \pi/n$ which *completely covers* the region inside the circle, and



so $u_n \geq A$. Hence, as before:

$$A \leq \lim_{n \rightarrow \infty} u_n = \lim_{n \rightarrow \infty} \pi r^2 \left(\frac{\sin \frac{\pi}{n}}{\frac{\pi}{n}} \right) \frac{1}{\cos \frac{\pi}{n}} = \pi r^2.$$

The demonstration is now complete. We have *disqualified* all possible candidates for the true value of A except for one and one only: $A = \pi r^2$. Notice that *infinitely* many triangulations were needed to achieve this exact result.

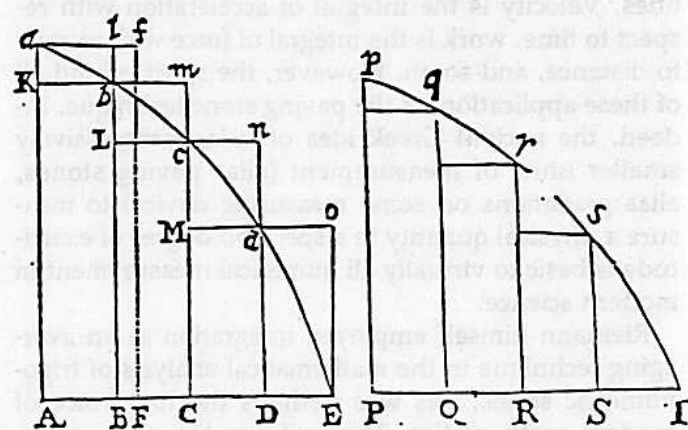
In an even more ingenious demonstration, Archimedes elucidated the area of a parabolic segment by considering triangulations of the sort pictured below: The uppermost vertex of the triangle labelled T is located at the point where the tangent to the parabola is parallel to the base of the segment. Archimedes showed that the area of the segment is exactly $4/3$ the area of T .

The tragic death of Archimedes at the hands of a Roman soldier in 214 B.C. marked the final stages of the Roman conquest of Greece. Nearly two millennia were to pass before very many exact results came to light which had not already been known to the Greeks, although a good deal of effort was devoted to approximations. Two things, perhaps, were needed before further progress became possible: (1) A better developed notion of *number*. Number is to measurement as money is to commerce. It provides a "common currency" for the description and comparison of areas and other types of measurement, whereas the Greek "barter system" only permitted one area to be directly compared to (or exchanged with) another. (2) The abandonment of the triangular paving stone. It made the calculations too difficult, and each particular case required too much ingenuity in order to ferret out workable triangulations. Undoubtedly such a step was psychologically very diffi-

cult. To abandon the triangle was to abandon Greek tradition.

3. From Newton to Riemann: The Fundamental Theorem of Calculus

Near the beginning of Isaac Newton's *Principia Mathematica* (1687) we find the following figures:



These figures depict a spectacular breakthrough in the use of pavings to obtain exact numerical measurements of area. Triangular paving stones are nowhere to be seen. Newton had replaced them by rectangles and, what is more, by long, thin rectangles which cover the given region in the manner of wallpaper (or floorboards). If a more accurate paving was desired, the rectangles were made thinner, but not appreciably shorter. The curved part of the boundary of the region was precisely described by a mathematical function f , the area of the region was explicitly realized as a mathematical limit of paved areas, and this limit was called the *integral* of f over an interval $[a, b]$, or $\int_a^b f(x) dx$ for short. Most important of all, the Fundamental

Theorem of Calculus made it possible (most of the time) to calculate this integral exactly, and to do so, moreover, without so much as a sideways glance at pavings. One simply needed to produce an antiderivative F of f , and the unknown area became just $F(b) - F(a)$. It is necessary to consider pavings (and so to perform "numerical integration") only on the rare occasions when F is unavailable. In this way the ad hoc methods of the past were supplanted by a systematic method of great power and scope.

All of these ideas appear in Newton's work, but they were not expressed with precision until the work of Cauchy in the 1820's. It was actually Cauchy who clarified the notions of derivative and integral by basing them upon the mathematical idea of limit. Cauchy's work was extended by Riemann in the 1850's, and the resulting integral bears Riemann's name. This is the integral which appears in all modern calculus textbooks.

Although the integral was originally conceived as a device for calculating areas, it became in the hands of Cauchy and Riemann more of an abstract technique of calculation. (Students of calculus will be aware that some of the rectangular "areas" are counted negatively in the "Riemann sums" which approximate the integral.) This abstractness enables it to be used in more than one way. It may be used to calculate areas, volumes, arc lengths, and many other physical quantities. Velocity is the integral of acceleration with respect to time, work is the integral of force with respect to distance, and so on. However, the spirit behind all of these applications is the paving stone technique. Indeed, the ancient Greek idea of using progressively smaller units of measurement (alias paving stones, alias gradations on some measuring device) to measure a physical quantity to a specified degree of exactitude is basic to virtually all numerical measurement in modern science.

Riemann himself employed integration as an averaging technique in the mathematical analysis of trigonometric series. His was perhaps the first voice of modern mathematics. The traditional mathematician said: "I see an attractive object. I shall study its properties." For Cauchy the attractive object was a continuous function. Its integral was one of its properties. The modern mathematician says: "I see an attractive property. I shall study the totality of objects which possess this property." Thus, a "Riemann-integrable function" is simply any function, however bizarre, for which Cauchy's definition of integral makes sense. The feelings of the traditionalists toward the modernists were summed up by the mathematician Hermite when he wrote: "I recoil in fright and horror from this lamentable plague of functions which do not have derivatives!"

The modern view has spawned a kind of mathemat-

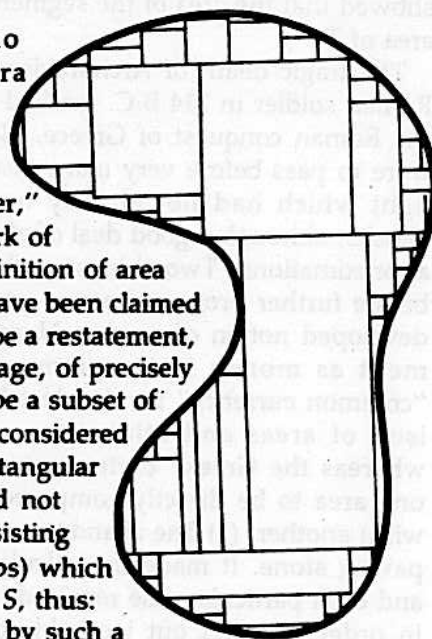
ical heroism, a climbing-of-the-mountain-because-it-is-there. The result has been an abstract mathematics of great generality, depth, beauty, and unenvisioned application. The modern view has also spawned a cancerous overgrowth of abstraction, a kind of art-for-art's-sake. This disease, popularly known as abstractionitis, is frequently marked by willful obscurantism, fueled by the desperation to publish, and sustained by cult worship. For better or for worse, the evolution of the traditional mathematical study of measurement into modern mathematical measure theory will be governed by the modern view.

II. Birth

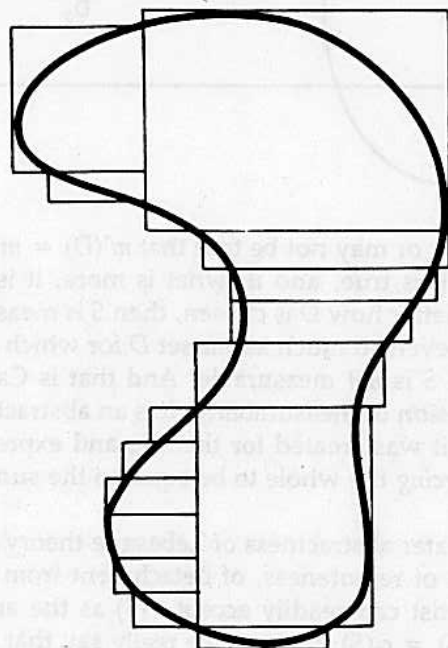
4. From Peano to Caratheodory: The emergence of abstract measure

Mathematical measure theory traces its modern origins to the work of Peano in the 1880's. Before this time people had imagined that they understood the concept of the area of a plane region. Moreover, it was widely felt that every subset of the plane did in fact have an area. If the subset was "civilized," then its area could be obtained at once from the Fundamental Theorem of Calculus. If not, then the area could at least be estimated, somehow, by a paved area. The precise nature of this estimation was not clear in the general case, but the problem very likely held little interest for the traditional mathematician. It was the modern inclination to study the totality of objects which possess some interesting property that led Peano to consider area, in its own right, as distinct from integral.

Although Peano drew his inspiration from Newton's "wall paperings," both "inner" and "outer," and from the work of Riemann, his definition of area would certainly have been claimed by the Greeks to be a restatement, in updated language, of precisely their idea. Let S be a subset of the plane. Peano considered the totality of rectangular pavings of S (and not just pavings consisting of long, thin strips) which lay entirely within S , thus: The area covered by such a



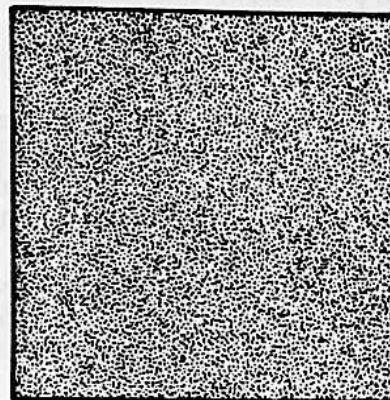
paving would have to be equal to or less than the area A of S . It follows that the *maximum* (or, where this does not exist, the "generalized maximum" or *supremum*) of all such paved areas constitutes an underestimate of A , a number which is equal to or less than A . This number is called the *inner content* of S and is denoted $c_*(S)$. At the same time, Peano considered the totality of rectangular pavings which *completely cover* S , thus:



The *minimum* (or, where this does not exist, the *infimum*) of the areas covered by such pavings constitutes an overestimate of A , a number which is equal to or greater than A . This number is called the *outer content* of S and is denoted $c^*(S)$. So we have $c_*(S) \leq A \leq c^*(S)$. If it happens that $c_*(S) = c^*(S)$, then A must exactly equal the common value of $c_*(S)$ and $c^*(S)$. This was Peano's *definition* of the area A of S . It is also called the *content* of S and is denoted $c(S)$. If it happened that $c_*(S) < c^*(S)$, then, so far as Peano was concerned, the set S did not *have* an area. It was not *measurable*. Peano's work was independently rediscovered and extended by Jordan in the 1890's (in particular, to a corresponding definition of *volume*), and Jordan's name is now attached to the general notions of content.

If every set S had a content in the sense of Peano and Jordan, the story might have ended with them. But it is very easy to describe a set S for which $c_*(S) < c^*(S)$, and yet which people felt *ought* to have an area. Let us say that a collection or family of objects O is *countable* if these objects may be indexed by whole numbers, thus: O_1, O_2, O_3, \dots . (Two different objects must receive different indices.) Every *finite* collection

of objects is thus countable, and some infinite collections are countable as well. Let us now take, say, a square S with area 1, and riddle it with "bulletholes," thus:



Let us make each bullethole exceedingly tiny, a single point in fact. But let there be countably infinitely many of them. With some care we may arrange the bulletholes so evenly throughout S that no rectangle in S , however small, fails to contain a bullethole. You will ask: Can any of S be left over after such a murderous fusillade? The answer is yes: *Uncountably* infinitely many points of S will remain. This is known from a celebrated argument of Cantor, the first prominent mathematical set theorist. From here it is not hard to see that our riddled square will have inner content 0 and outer content 1, hence no area. The set B of bulletholes which we have removed from S also has inner content 0 and outer content 1. (One can already imagine the traditional mathematician recoiling in fright and horror.)

But now B is a countable set. Many people felt that any countable set *should* have an area, and that this area *should* be zero. It can be shown that if a rectangle is subdivided into countably many smaller rectangles, then its area is always the sum of the areas of the smaller rectangles, even when there are infinitely many of these smaller rectangles. (This fact will later be called the *countable additivity* of area measure.) Likewise the set B may be subdivided into countably many *single points*. A single point has zero area by anybody's definition. So B *ought* to have zero area as well, and, therefore, the riddled square *ought* to have area equal to 1. In this way intuition called out for an extension of the Peano-Jordan definition of area. But it was not immediately clear how to proceed.

The spark of inspiration came from Emile Borel around the turn of the century:

Use infinitely many paving stones.

More specifically, cover an arbitrary set S with infinitely many nonoverlapping rectangles instead of just

finitely many as Peano and Jordan had done. (However, because of the nonoverlap, this infinity would have to be countable.) An infinity of stones, most of them exceedingly tiny, could undoubtedly percolate more effectively down through the various nooks, crevices, cracks, potholes, or other irregularities in the shape of S . Consequently one should be able to achieve a better fit between S and the region covered by the stones.

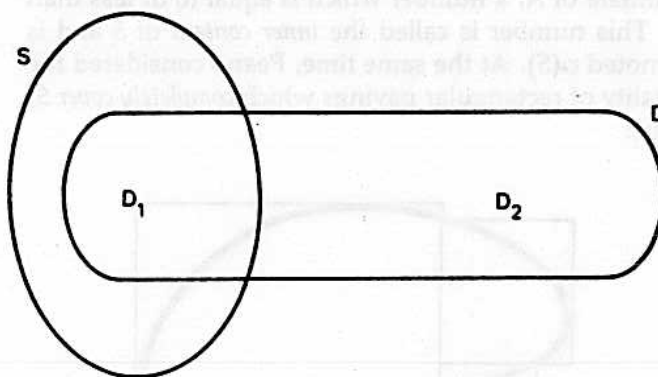
Borel's idea was seized upon and developed into a proper mathematical theory by his student Henri Lebesgue. The *Lebesgue outer measure* $m^*(S)$ of a planar set S is defined by exact analogy to the outer content of S , except that infinite pavings are used as well as finite ones. This increases the number of paved areas under consideration, and so the minimum (or infimum) of these areas has to be correspondingly *smaller*, i.e. $m^*(S) \leq c^*(S)$.

Lebesgue hoped that $m^*(S)$ would serve as a "true" area measure of S . But this hope needed to be justified on rational grounds. Otherwise $m^*(S)$ would have been an "abstract nonsense" of little enduring interest. The preliminary evidence was encouraging. If S already had an area A from some earlier definition, then, in all cases, it could be *proved* that $A = m^*(S)$. This included the case of an *unbounded* set S , a set which "extends out to infinity" and which therefore, by definition, cannot be completely covered with only finitely many rectangles. Most such sets, including the plane itself, have area (and outer measure) equal to $+\infty$. But some had been given a finite area A by means of so-called *improper* Riemann integrals. In these cases, too, A was equal to the outer measure of the set. Moreover, the outer measure of the riddled square was 1, and the outer measure of the set B of "bullet holes" was 0, as intuition had demanded.

BUT—there was one tiny problem. It was not clear for the Lebesgue outer measure, nor was it true, that the whole was always going to be equal to the sum of the parts. Lebesgue dealt with this problem in the spirit of Peano and Jordan. He created a new notion of *inner measure* $m_*(S)$ of S (a notion *not* analogous to the inner content $c_*(S)$ and now archaic), he declared the set S to be (*Lebesgue*) *measurable* if $m_*(S) = m^*(S)$, and he defined the (*Lebesgue*) *measure* $m(S)$ of a measurable set S to be the common value of $m_*(S)$ and $m^*(S)$. He also established the *countable additivity* of outer measure on the measurable sets—that is, he proved that if a *measurable* set S is subdivided into countably many non-overlapping *measurable* subsets, then $m^*(S)$ is precisely the sum of the outer measures of the subsets. The whole is equal to the sum of the parts for *measurable* sets.

Lebesgue's notion of measurability was later reformulated by Caratheodory without using inner measure, and it is Caratheodory's version which appears

in contemporary textbooks of measure theory. It runs as follows: Consider any set D along with our given set S . Think of S as a *knife* which is used to cut D up into two pieces $D_1 = D \cap S$, and $D_2 = D \setminus S$, thus:



Now it may or may not be true that $m^*(D) = m^*(D_1) + m^*(D_2)$. If it is true, and if, what is more, it is *always* true, no matter how D is chosen, then S is measurable. If there is even so much as *one* set D for which it is *not* true, then S is *not* measurable. And that is Caratheodory's version of measurability. It is an abstract definition, and it was created for the sole and express purpose of *forcing* the whole to be equal to the sum of the parts.

The greater abstractness of Lebesgue theory gave to it an aura of remoteness, of detachment from reality. The scientist can readily accept $c^*(S)$ as the area of S when $c^*(S) = c_*(S)$. But can we really say that $m^*(S)$ is the true area of S when S is "measurable" in this very technical sense? To this question the mathematician responds with the serene air of one who knows that he is going to win the argument: "What do you *mean* by the 'true area' of S ?" he says. The scientist does not know. Neither does the mathematician. All the mathematician can do is to adduce evidence in the form of mathematical theorems and examples which will persuade the scientist to accept Lebesgue's measure as the *definition* of area. The positive evidence is strong. Area is countably additive on rectangles. This can be *proved*. If the scientist will believe, on this evidence, that area is countably additive in general, then it can again be *proved* that the Lebesgue measure of a measurable set is precisely the area of that set. There is no negative evidence. No one has found an example of a measurable set (and this includes all of the sets whose areas had previously been defined) for which any sort of intuition demands an area other than the Lebesgue measure of that set. No one has found an example of a nonmeasurable set for which there is *any* intuitive idea about what the area of that set should be. We shall return to this point.

It was quickly realized that Lebesgue's construction of measure as a "countably additive set function" was

quite general. In one dimension, one can use intervals as paving stones to produce a generalized notion of length. (This is the Lebesgue measure, the measure which he himself first constructed.) In three dimensions, one can use rectangular boxes as paving stones to produce a generalized notion of volume, and so on, analogously, in higher dimensions. In fact, as was later clarified by Caratheodory, objects which are quite abstract in their nature can serve as paving stones. Subject to a few simple conditions being met, a (countably additive) measurement on these abstract paving stones may be extended via infinite pavings, in the manner of Lebesgue's construction of outer measure, to a wide variety of more complicated objects. In this way the modern theory of abstract measure was born. It will enjoy an unenvisioned wealth of applications.

III. Maturity

5. The Lebesgue integral

The Riemann integral suffered the same shortcomings as the Peano-Jordan definition of area. Intuition demanded that certain specific functions have an integral, even though the Cauchy-Riemann definition of integral did not make sense for these functions. Lebesgue, like Riemann before him, was more interested in integration than in measurement, and it seems that he constructed his original measure with the principal aim of extending the earlier definition of integral. He ended up doing much more: He reconceptualized the whole notion of integral. His integral was indeed an extension of Riemann's, but it is quite a chore to prove this. Most importantly, his integral (of a mathematical function) depended solely upon the underlying measure. Hence it could be defined in a completely abstract setting, providing only that a measure (of the abstract objects in that setting) was present. The Riemann idea of integral, on the other hand, could not free itself from the ambience of the traditional Euclidean spaces (the line, the plane, etc.)

It must be said that Lebesgue's integral does not supply simple, magical formulas for areas and volumes which cannot already be obtained from the Fundamental Theorem of Calculus. Indeed, Lebesgue hesitated at first to publish his new theory for fear that it might amount to little more than a mathematical teratology. He need not have worried. The abstract theory of measure and integral has become as pervasive in modern mathematical analysis as Riemann's integral is in modern science. Even the traditional mathematicians warmed to it (somewhat) when it was seen to clarify and to simplify much of the previous theory, as well as just to extend it. For example, a

bounded function is Riemann-integrable if and only if it is continuous "almost everywhere." This fact could not be proved before Lebesgue because it does not make sense without Lebesgue's theory. It *greatly clarifies* the precise extent to which Riemann extended Cauchy's definition of integral. For another example, the rigorous justification that so-called double and triple integrals may be used to calculate certain areas and volumes is *greatly simplified* when these Riemann integrals are regarded instead as Lebesgue integrals.

The final tribute to the Lebesgue theory was paid during the 1930s and 1940s, which witnessed a minor outbreak of abstractionitis in this area. The result was a "lamentable plague" (albeit a small one) of ultra-abstract integral-like monstrosities, most of which have now happily passed into oblivion.

The next section will record just one of the success stories created by the Lebesgue theory, which, in its abstract version, is today called *measure theory*.

6. From Laplace to Kolmogoroff: Measure and probability

Probability theory originated in the seventeenth century with some mathematical problems inspired by gambling. The earliest work was systematized and extended in the early 1800s by Laplace, who wrote: "The theory of probability is just good common sense reduced to formulas." It seems that in those days probability was not regarded as a proper branch of mathematics, but rather as a separate discipline which made use of mathematical tools. (Perhaps the association with gambling gave it a tinge of non-respectability.) In any event, those who worked with probability were unmoved by the crisis which occurred in mathematics around 1900. The modern concern in mathematics with the *totality* of all objects which possess a certain property had led to the famous paradox (self-contradictory statement) about the "set of all sets." From this paradox emerged the "new mathematics," a mathematics totally founded upon the (revised) theory of sets, and having much higher standards of correctness in logical argument. To all of this the probabilists said: "It won't happen to us." It did.

In the 1920's probability theory experienced a paradox of its own, the famous *waiting time paradox*. The problem was this: Buses arrive at a bus stop at various random times, with future arrivals completely independent of past arrivals (or non-arrivals). Two successive buses arrive, on average, one hour apart. I arrive at the bus stop at nine o'clock sharp. How long, on average, must I wait for the next bus? One line of argument ran to the effect that, because previous arrivals were irrelevant, I should expect to wait for the full hour. A second line of argument ran that, because

I shall arrive, on average, half way between two successive buses, I can expect to wait for only half an hour. These arguments were contradictory. Therefore at least one of them was incorrect. But the error could not be detected. Both arguments were correct by the standards of logic then prevailing in probability theory.

It is difficult to overstate the seriousness of this situation, for who could now judge whether any argument in probability theory was correct? Centuries of painstaking search for probabilistic truths about our uncertain world might have amounted to nothing more than arrant nonsense.

Probability was rescued by A. N. Kolmogoroff in the 1930s. He single-handedly fashioned probability theory into a fully rigorous branch of mathematics based upon the ideas of measure theory. In so doing he gave to the subject a conceptual clarity it had never known. This clarity helped make it possible to catch the subtle error of reasoning in the waiting time problem (the first answer is correct), and it launched probability theory on a course of rapid development towards many exciting discoveries, discoveries which could scarcely have been imagined by its founding fathers.

The basic object of study in classical probability theory was the *event*, either a happening in the real world or an abstract event in some hypothetical model of the real world. Many events can be imagined (for example, you could die tomorrow), but only some actually occur. Thus, every event E was presumed to be possessed of a subtle quality, something like its *ability* to occur (at some given time), which could be precisely quantified by a number $P(E)$ between 0 and 1. This number was called the *probability* of E . Just as with area measurement, all numerical calculations of probabilities presupposed that the probabilities of certain "basic" events were known in advance. (Students of probability often miss this vital point, especially when the known probabilities are only hinted at by use of the word "random.") A major thorn in the flesh of the early theory was that in almost no case could the probability of a "basic" event be measured empirically in the same straightforward manner as the area of a rectangle. That certain something about E which $P(E)$ was supposed to capture so precisely had remained elusive, in spite of serious early attempts to nail it down. An apocryphal tale runs to the effect that, during the crisis sparked off by the waiting time paradox, one could always get a real rise out of an old-time probabilist by asking him, with a serene air: "What do you mean by the 'probability' of an event?" The old-timer, with a great waving of arms and reddening of face, would declaim an endless cycle of clichés—it is "chance," it is "likelihood," it is "long term relative frequency," it is "degree of certitude"—and, if suitably provoked, might even descend to the

tactics of the intellectual bully: "You know what I mean!" After all of this drama, surely you must! But nobody really did, except the cult followers.

Kolmogoroff fished out the one feature of probability which was truly mathematical in nature. This was the time-honored supposition that probability was a genuine form of measurement, that the whole was equal to the sum of the parts. If a general event E is subdivided into simpler or more specific events E_1, E_2, \dots , and if these simpler events are *mutually exclusive* (that is, no two of them can occur at the same time), then $P(E) = P(E_1) + P(E_2) + \dots$. Kolmogoroff's genius lay in his recognition that the basic events whose probabilities were known in advance could (in most cases) serve as "paving stones." Hence the Euclid-Archimedes-Newton-Riemann-Peano-Jordan-Borel-Lebesgue-Caratheodory paving stone technique could be used, in the manner of the Lebesgue outer measure, to completely determine the probabilities of a much wider collection of "measurable" events. Probability was purely and simply an example of abstract measure.

A second basic object in the classical theory was the *random variable*, originally a "variable that varied randomly," but later recognized as an example of a mathematical function. Random variables arose naturally from numerical descriptions of the nonprobabilistic features of events (for example, the number of heads turning up in ten tosses of a coin). Each random variable determined an *array* or *distribution* of probabilities of the events to which it gave numerical description (for example, the *event* that exactly five heads will turn up in the ten tosses). In simple cases the numerical description could be combined in a natural way with the array of probabilities to produce a notion of the *average* or *expected value* of the random variable. The expected value of a random variable X is written EX . The original motive for defining EX came from gambling: If X constitutes the amount of money I could win in a game of chance, then, for the game to be fair, I should pay EX for the privilege of playing this game.

Random variables originally came in two distinct types, "discrete" and "continuous." A separate theory was devoted to each type. The old-timers were vaguely aware that there were certain oddball or "singular" random variables which did not fit into the established categories, but such oddities surely could never "arise in practice." (They did.) Kolmogoroff recognized that in all previously studied cases, EX was precisely the abstract Lebesgue integral of the function X with respect to the probability measure P . With considerable intuitive justification, he defined EX to be this integral in all cases. He thereby unified the two separate theories and greatly extended the range of random variables (including the "oddballs") for which it made sense to speak of EX (and also of other "mo-

ments" of X such as the *variance*). The extension was comparable in its effect to Lebesgue's extension of the Riemann integral.

In this way Kolmogoroff built up a small lexicon, with the *mathematical* notions of set, measure, function, and integral securely joined to the *probabilistic* notions of event, probability, random variable, and expected value. This lexicon is the Rosetta stone of probability theory. With it one can decipher in precise mathematical terms what is really going on in this theory. The new *mathematical* theory of probability raised the standards of logic in previous work (for example, in the calculation of $P(E)$ when infinitely many paving stones are involved), and it also relegated all notions about the "true nature" of probability to the realm of philosophical speculation. A conclusion based upon such notions would now only be accepted as a *conjecture* requiring rigorous proof.

Probability features as a major tool in mathematical statistics, where the goal is to obtain accurate information about a population after observing only a relatively small sample from that population. (The most widely known samplings are the public opinion polls.) For this purpose statisticians rely upon certain random variables which are known as *test statistics*. Some of these are likely to furnish more information about the population than others, and one can ask whether there is a particular test statistic which best performs this task. Measure theoretic probability provides (1) a greater range of random variables from which to select a possible "best" statistic, (2) more refined logical tools to convincingly demonstrate that a given candidate is the best, and (3) a fresh perspective on some of the traditional criteria of "goodness" of a test statistic. In particular, it was found that the notion of a *sufficient* statistic could not be adequately formulated without the language of measure theory.

It is no accident that Jerzy Neyman, the "father of modern statistics," devoted his first major student essay to an exposition of the (then) new-fangled Lebesgue integral. He had originally planned to devote his career to abstract measure theory, but instead he was to play a predominant role in developing the mathematical theory of statistical hypothesis testing. This theory made it possible, at last, to achieve an empirically sound procedure (using test statistics) for "measuring" probabilities in the real world, at least in the practical scientific sense of estimating an idealized true value.

7. Nonmeasurable sets

Those who work with measure theory (and particularly probabilists, as it happens) must always beware the nonmeasurable set. Even today many in the math-

ematical community harbor vestiges of a kind of primordial fear of these entities. It is as if they were wolves in the forest, patiently waiting to ensnare the too adventurous traveller in the jaws of unholy paradox.

A nonmeasurable subset of Euclidean space must be presumed to be a kind of sophisticated version of the riddled square. It is so *thoroughly* riddled, pock-marked, "moth-eaten," or whatever, that even an infinity of paving stones cannot adequately percolate through it. Unlike the riddled square, no such set can be explicitly described. The fact that they exist at all may only be demonstrated by using the so-called *Axiom of Choice*, a once controversial but now accepted extra axiom of basic set theory. It is said that, to his dying day, Lebesgue never did accept the Axiom of Choice. He wanted to (and apparently did) believe that *every* subset of Euclidean space was measurable.

The origins of the unease about nonmeasurability are to be found in the strong intuitions of the time. If one person has a height, then so should every person. If one event has a probability, then so should every event. If one portion of our universe has a volume, then so should every portion. To measure the volume of a three-dimensional set of points, simply fill up the set with water(?), pour the water into a graduated beaker, and read off the volume. It sounds entirely straightforward.

The notion of nonmeasurability raised the spectre of a set or object so inconceivably strange that it might not *have* a volume. Its volume is not merely impractical or impossible to measure, it is *not there at all*. This spectre was given flesh by the mathematical logician Alfred Tarski. He gave a fully rigorous demonstration that a solid sphere with radius 1 could be subdivided into finitely many nonoverlapping subsets which, in turn, could be rearranged in the manner of a Chinese puzzle to form a solid sphere with radius 2. Thus, the subsets were not expanded, contracted, bent, twisted, or otherwise deformed in any way. They were merely *rigidly moved* through space to achieve the rearrangement. Intuition demands that the volume of an object remain unchanged when it is rigidly moved through space. It also demands of the volume measure that the whole be equal to the sum of the parts. And yet the second sphere has *eight times* the volume of the first. This is a paradox, a logical impossibility. Mathematicians had eventually resolved the paradox of the "set of all sets" by agreeing that the "class" of all sets is *not itself a set*. With that experience behind them, they immediately resolved this new paradox by agreeing that *there is a set with no volume*. Logic is satisfied, but *psychologically* the conclusion is still very hard to swallow.

The mathematical theory of measure is officially agnostic about nonmeasurable sets, just as it is agnostic

about the "true nature" of probability. A nonmeasurable set is simply a set about which there is no information, at least no information which the paving stones can provide. If a nonmeasurable set N could be somehow independently measured, and if this measurement were compatible with the other measurements (specifically, if its value lies between $m_*(N)$ and $m^*(N)$) then theory permits N to be added in as an additional paving stone when the measure is constructed. All paving stones are measurable (this is a theorem of measure theory), and so N is now officially measurable. "Whosoever shall tame the beast, let him first seek the true measure thereof." The modern probabilists in particular seem never to have enough measurable events, and they have devoted considerable effort to the search for reasonable ways to extend some of Kolmogoroff's original probability measures. Perhaps one day an enterprising mathematical physicist will seek to enlarge the notion of volume in a useful way, thereby creating the possibility that a suitably bizarre object might actually alter its volume as it moves quietly through space.

8. Coda

In the preface to a 1965 textbook still in use today, an important transitional figure in probability wrote: "The main function of measure theory . . . is to justify . . . passages to the limit that would never be questioned by a non-mathematician. Readers interested primarily in practical results will therefore not feel any need for measure theory." This statement reflects the cautious attitude of the traditional mathematician (and of some present-day applied mathematicians) toward the more abstract branches of modern mathematics.

Enthusiasm for this subject may be fostered in two ways: (1) when a teacher, through personal influence and deep understanding of the material, is able to reveal its intrinsic merits; or (2) when earlier mathematics (which, in the case of measure theory, includes calculus and classical probability) is studied to the point where one can genuinely appreciate the manner in which the new theory improves upon the old. The second approach may involve the learning of some obsolete material, but it places the student in a better position to distinguish the real gems of modern mathematics from the fevered ravings of advanced abstractionitis.

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Who Dunn It?

What everyone remembered about him were "his strange inventions and extraordinary inclination for mechanical works." He filled his room in the garret with tools, spending all the money his mother gave him on them. While the other boys played their games, he made things from wood, not just doll furniture for the girls, but also and especially models. A windmill was built north of . . . while he was there. Although water wheels were common in the area, windmills were not, and the inhabitants of . . . used to walk out to watch its construction for diversion. Only the school boy . . . inspected it so closely that he could build a model of it, as good a piece of workmanship as the original and one which worked when he set it on the roof. He went the original one better. He

equipped his model with a treadmill run by a mouse which was urged on either by tugs on a string tied to its tail or by corn placed above it to the front . . . called the mouse his miller. He made a little vehicle for himself, a four-wheeled cart run by a crank which he turned as he sat in it. He made a lantern of "crumpled paper" to light his way to school on dark winter mornings, which he could simply fold up and put in his pocket for the day. The lantern had other possibilities; attached to the tail of a kite at night, it "wonder-caus'd not a little discourse on the market days, among the country people, when over their mugs of ale."

Answer on page 86.

Worthy Causes: have you hugged a musicologist lately?

The next time you listen to a Bach chorale prelude or a Verdi aria, take a moment to offer silent thanks to the unsung heroes who help make that music possible: the musicologists.

A musicologist, according to one of Chicago's best examples of the type, Philip Gossett, is "anyone who studies music seriously in any field of scholarship, including music history, theory, and ethnomusicology. In defining 'musicologist' for the American Musicological Society (AMS), we insisted on the all-inclusiveness of the term." A musicologist spends large amounts of time rifling through old libraries for lost manuscripts, checking through orchestral parts for corrections, tracking down obscure references in contemporary musical accounts, overseeing critical editions, or all of the above. To many, the musicologist's contribution may seem abstruse, of minor importance, but such, insists Gossett, is far from the case.

Consider that Johann Sebastian Bach in the century after his death was an almost forgotten composer; generations of musicologists have worked to bring his music to light and publication—including the American musicologist who only last year turned up 32 previously unknown organ preludes. Recently a lost Mozart symphony turned up in Sweden: "We knew the piece existed," explains Gossett, "and when the parts turned up we had a pretty good idea what we had found. Over the last ten years we've reconstructed the original five-act version of Verdi's opera *Don Carlos*, restoring sections of music that had never gotten into print. Then, recently, an unknown Haydn mass was found in a barn in England. Sometimes manuscripts get sold in estate auctions, and no one knows what happened to them until they turn up years later."

Professor at the University of Chicago since 1968, vice-president of the AMS, and one of the world's foremost scholars in the field of Italian opera, Philip Gossett has made his own share of exciting discoveries. "We knew that in 1825 Rossini had written an opera, *Il viaggio a Reims*—The Voyage to Rheims—for the coronation of Charles X of France. It was performed three times, then Rossini let it go. Some years ago, a student of mine, Elizabeth Bartlet, painstakingly turned up some altered parts from the opera in an uncata-

logued collection in Paris. Some wag had found the original opera and revised the parts to fit a comic opera on some topical subject.

"A few years later I was doing research in Rome, and the librarian, who knew I had devoted years to the study of Rossini's work, came up and said, 'I have something I think you'd like to see.' It was the autograph manuscript to most of the music of *Il viaggio a Reims*. She'd been hiding it for years, one doesn't know why. Then, years later some more manipulated parts turned up in Vienna, with the text rewritten to celebrate the marriage of Franz Joseph in 1854. Between these sources we were able to reconstruct 98 percent of the opera. The rest, frankly, we wrote. I mean, we had to fill out some of the recitative, add a second violin part here and there—make that 99.8 percent. Finally, in 1984 Claudio Abbado conducted the work's first performance in modern times, and last year he recorded *Il viaggio a Reims* for Deutsche Grammophon."

While few musicologists get to restore entire lost operas by major composers, even their less startling achievements can have considerable ramifications for performance. Professor Gossett's work with Italian opera has been especially important in this respect. "It wasn't typical in 19th-century Italy to produce full scores. Wagner had his scores printed, France printed its scores, but there was no equivalent in Italy to the kind of centralized activity that went on in Paris. As a result, Verdi never saw his scores through print; he entrusted the piano reductions to other musicians, and then he wrote to publishers, 'Why are my scores full of errors?'"

"Rossini was particularly misunderstood by the late 19th century. They didn't like the piccolo so they substituted flutes, and they kept adding brass until the whole sound quality was changed. They took out his 'dirty chords'; Rossini added unconventional sixths and major sevenths to triads for very specific effects he wanted, and 19th-century editors took them out. We've been putting them back in, and as a result Rossini's whole reputation as a harmonist has changed."

Gossett is the general editor of a new complete edition of Verdi's music, being published by the University of Chicago in cooperation with Casa Ricordi in Italy. Never content with academic abstractions, he has maintained close contact

with the performing community. "Aside from standards of scholarly accuracy and musicality, we make all philological decisions with an awareness of naturalness of performance. In fact, we try to have operas in production before we commit to print, so that singers and conductors can point out if something doesn't seem to work."

The AMS, fearful of what would happen to musical performance if musicologists were to discontinue their work, has instituted a fellowship program for young musicologists' education and research, an effort for which funds are sorely needed. Because of their mutual involvement in *Il viaggio a Reims*, Gossett turned to Claudio Abbado, associate conductor of the Chicago Symphony, for help. "He suggested conducting a benefit concert for us; I would never have dared think of such a thing. He felt very strongly that the public should be made more aware of the work musicologists do and its profound effect on musical life."

That concert, sponsored by AT&T and aptly called "Bravo Abbado!" will take place Saturday, November 15, at 4 PM at Orchestra Hall, 220 S. Michigan. Conducting members of the CSO, Abbado is donating his performance, as are pianist Rudolf Firkusny, soloist for Beethoven's Piano Concerto no. 4, and singers Piero Cappuccilli, Ellen Shada, Gwynne Howell, and Lucia Valentini-Terrani, who will sing selected arias from the operas of Verdi and Rossini, some of which owe much to the restorative efforts of musicologists. The program also includes Beethoven's *Coriolanus* Overture. No less than Luciano Pavarotti has promised to make an appearance, and if he isn't too fatigued from his present performances of the Lyric Opera's *Un ballo in maschera*, he'll even sing. General tickets range from \$6 to \$30; phone 962-8484 for more information.

For this collaborative venture Gossett is thankful he lives in Chicago: "My friends in universities in New York envy me when I tell them what we're able to accomplish here. Chicago is a wonderful place for the interaction of such different constituencies. Nowhere else are scholars given as great a chance to work on projects hand in hand with organizations like the Lyric Opera and CSO." This is your chance to lend your own helping hand.

— Kyle Gann

READER

Folkstream

Cajuns and Their Music

by Polly Campbell

Cajun and Zydeco music has gained enormous popularity in the last several years. While bands and performers have made this music popular, it is truly folk music--folks play it on their back porches or at neighborhood get-togethers. Many of the best Cajun musicians have never made a record, and even the well-known ones usually have another job, playing music as an avocation. The beloved accordionist Nathan Abshire was the guardian of the Basile town dump. D. L. Menard makes chairs, and fiddler Dewey Balfa drives a school bus. Many of these musicians have given up music completely for long periods of their lives while they made a living and raised a family.

Modern Cajun music is to relax with after a hard work week, for socializing with other families spread across the prairies and especially, it's for dancing. Early Cajun songs were not so carefree, telling the story of wandering and hardship. That melancholy, plaintive sound is still an obvious component of the Cajun sound. The fiddle was the first instrument to accompany the voice. Two fiddles, one playing melody, one playing rhythmic back-up, formed the band at early social events like bougeries, communal butcherings where meat was shared among neighbors, or bals de maison. At these bals, traditional polkas and French dances were supplemented by reels and hoedowns learned from Anglo-American neighbors. These dances were also known as fais do-do, which means "go to sleep", though only the children would sleep, as the Cajun love for dancing is one of the proudest aspects of the Cajun culture. Even today, the fais do-do, though more likely to take place in a dance hall than someone's house, is a central part of Cajun life, as is a general ability to have a good time, or laissez les bon temps rulez. The old fiddle tunes from this early period of Cajun music have mostly died out, but a few musicians still remember them, like 94-year old Dennis McGee of Eunice, and his secondeur, Sady Courville.

In the mid-1800s, the accordion was introduced into the music by German and Texan neighbors. It became popular quickly, as its loud volume was perfect for crowded dance halls and it soon dominated the Cajun dance band. At the same time, many bands added a box guitar and triangle or "tit fer" for rhythm, forming the basis of today's typical Cajun band. Black Creole accordionists like the fabled Amede Ardoin played an important role, contributing a syncopated style and the influence of blues. Even through segregated eras, there was much sharing of music between black and white musicians.

Around the turn of this century, the isolation that had allowed Cajuns to develop culturally was interrupted by several factors: the discovery of oil in Acadiana, the building of roads, and the general trend toward acculturation. French was forbidden in school, and upward mobility demanded a dropping of

"hillbilly" music and country swing became popular in Louisiana, and many bands dropped the accordion in favor of a more countrified sound, adding drum sets, steel guitars, and amplification. The Hackberry Ramblers were a successful band from that era.

Before it was too late to lose the old tradition, Cajun music went through its first revival, starting in 1948, when Iry LeJeune began recording in an old-time accordion style. He sparked great interest in more traditional Cajun sounds.

Since then, Cajun music has continued to evolve, fueled by tradition, and sometimes from interest from outside. When the Balfa Brothers played the Newport Folk Festival in 1967, they were greatly impressed and inspired by the thousands of people who loved their music, which at times was reviled or taken for granted at home in Louisiana. As cultural identity has become more important, organizations have worked to preserve old traditions, and French is now being taught in schools where it was once forbidden. Bands like Beausoleil and the Savoy-Doucet band feature young players reviving old sounds, while Zachary Richard plays Cajun rock and roll, and older musicians like Belton Richard continue to play the music they grew up with.

Black Creole music developed side by side with Cajun music, and constant musical exchanges took place between the two groups. Black musicians often played at white house parties, and white musicians often sat in with their Creole counterparts. So, like Cajuns, Creoles played old-fashioned dance music like mazurkas and contradances on the fiddle and accordion, but with syncopated African rhythms. A glimpse of the old style is evident in the playing of Bois Sec Ardoin and Canray Fontenot, accordionist and fiddler, who still play and sing stories of their life. After World War II, Creole music developed into "la-la" or "pic-nic": fast French dance music with a rhythm and blues influence, played on the accordion, guitar, and drums. The fiddle was generally eliminated, and the washboard developed into a corrugated steel vest or fratitoir, rubbed in rhythm by the wearer. When Clifton Chenier recorded in 1965 the tune "Les Haricots N'est Pas Sale" (the beans aren't salty), the

music began to be called Zydeco, from the pronunciation of les haricots. Chenier popularized the music, and defined the style to a large extent, earning the title "King of Zydeco." Because it was hard to make a living doing only "French" music, he added a heavy dose of rhythm and blues, using a horn section and doing classic blues tunes. Zydeco is still popular among Creoles of Louisiana, where it is played in dance halls and on the radio; the music is catching on everywhere as more Zydeco bands tour the country. Though Chenier is aging, new "princes" and a "queen" of Zydeco -- like Rockin' Dopsie, Buckwheat, and Queen Ida -- are carrying on and extending the tradition.

Both Cajun and Zydeco music are still vital, living expressions of their cultures. Young musicians still pick it up instead of country or rock, and while many blend the old influences with modern popular music, others are reaching farther back to traditional roots. But this is not museum music; it is an evolving expression of life and indicates that the culture from which it comes is alive and well.

Cincinnati Folk Life

For information, write to CFL, 210 E. 8th St., Cincinnati, OH 45202; or call (513) 281-5944 or (513) 542-7460

SCIENCE AND TECHNOLOGY

Why some people get AIDS and others don't

Many scientists have come to believe that if science can defeat AIDS, it can defeat any disease. They reason that not only is the effort going into AIDS far greater than was ever devoted to any other disease, but that AIDS has such a wide repertoire of tricks that understanding them all will bring an understanding of everything from cancer to the common cold.

The first good example of this prophecy came true earlier this month, with the publication of what is probably the most important discovery about the disease since the identification of the virus that causes it. Seven British scientists have found one reason that not all people exposed to the AIDS virus get AIDS, and why many of those infected show no symptoms for so long. This is not just the biggest mystery about AIDS, it is one of the abiding puzzles about all infectious diseases. Why, for example, did influenza kill 20m people immediately after the first world war, whereas now it simply sends you to bed for a few days? What controls the virulence and infectiousness of diseases?

The answer that the British scientists give is genes. Just as some people have blue eyes and some brown, so some people have genes that resist infection with the AIDS virus and others have genes that do not. It has long been realised that, over the generations, bugs and their victims come to an evolutionary accommodation, in which the resistance of the victim increases and the virulence of the pathogen declines. Until recently, most people thought the pathogen's genes were more important than the victim's in determining virulence. The British findings show that both matter.

To guess that genes are involved is easy. To find the relevant genes is difficult. Dr Anthony Pinching, Dr Keith Nye, Dr Lesley-Jane Eales and their colleagues at St Mary's Hospital in London stumbled on the right gene almost by accident. They were looking to see if certain genes were more common among AIDS patients than among people at large. The ones they chose were not, but Dr Nye noticed that a different gene he had studied before—fortune favours the well prepared—was,

indeed, more common. The gene, which is called "Gc", comes in three forms: 1f, 1s, and 2. Since humans have two copies of every gene, there are six combinations of the Gc variants that people can have: 1f-1f, 1f-1s, 1s-1s, 2-1f, 2-1s, and 2-2. Dr Pinching's team found that people with the 1f variant are far more likely than average to catch the AIDS virus and those with the 2 variant are far less likely. Those with 1f-1f are worst off and those with 2-2 are best off.

Their study included only 375 people, so it may not be representative. Nonetheless, for their sample the statistics are striking: of

transporting vitamin D into the cell. The main difference between the 1f, 1s and 2 versions of the protein is that 1f has more of a chemical called sialic acid on the outside of the cell membrane than Gc 1s, while Gc 2 has none. Dr Pinching speculates that the sialic acid somehow helps the AIDS virus get into the cell by assisting it through the membrane.

The study shows that the same genes also influence the severity of AIDS in those infected with the virus. Those with Gc 1f are more likely to go on to develop the full disease soon after infection, and those with Gc 2 less likely than the average. Probably, again, the sialic acid helps the virus go from cell to cell.

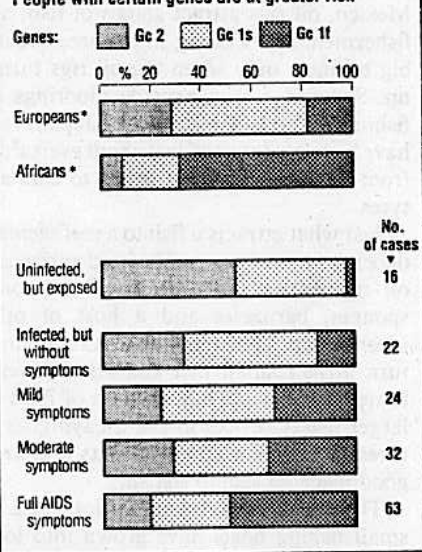
This is more surprising than the previous result, for scientists had long suspected that the only things that triggered the awakening of the dormant virus—and so of AIDS itself—were time, or another infectious disease. Certainly, stimulating the body's immune system to fight a different disease seems to increase the risk of waking up the virus. A study just published shows that heterosexual AIDS victims in Zaire and homosexual AIDS victims in America have one thing in common that sets them apart from uninfected people—a high level of infection with four other viruses: cytomegalovirus, Epstein-Barr virus, herpes and hepatitis-B.

In a recent case, the American army concluded that smallpox vaccine might have awakened the dormant infection in one recruit. This led to a report that the World Health Organisation's successful campaign to eradicate smallpox that ended in 1980 may have been responsible for starting the AIDS epidemic. This is nonsense. The only evidence is a rough (in fact, poor) coincidence of timing and geography, and while the vaccine just might help the virus kill, it cannot help the virus spread. AIDS is the spread of a new virus, not a change in the virulence of a widespread one. The AIDS virus spread into, for example, Zambia in the 1980s, long after the small-pox campaign had ceased there.

The fact that the Gc gene affects the virulence of the disease is good news. For the first time, it suggests that present estimates of how many of those infected will go on to develop the disease may be exaggerated. It shows that there is a genetic difference between those who are likely to develop symptoms quickly and those who are not. This implies that many of those who do not develop symptoms quickly

The genes of AIDS

People with certain genes are at greater risk



Source: The Lancet

*Population averages from other studies

a group of homosexuals who had not caught the virus despite having regular, unprotected anal sex with partners who were carrying the virus, not one of them had the Gc 1f-1f combination; 25% of them had Gc 2-2. None of the men with AIDS had Gc 2-2, while 30% of them had Gc 1f-1f. Among the control group of healthy heterosexuals, 9% had 2-2 and fewer than 1% had 1f-1f.

Quite why this should be so, nobody knows. The Gc gene makes a protein that sits on the cell surface and plays a role in

SCIENCE AND TECHNOLOGY

might never do so. It also implies that death rates will be highest in the earliest years of an epidemic of AIDS, for those most likely to catch the virus are also most likely to develop symptoms.

The discovery involves some good news for Europe and America, and some bad news for Africa. Among people from central Africa, the Gc 1f gene is much more common and the Gc 2 gene much scarcer than among people of European origin. So the average African may be genetically more susceptible to the AIDS virus than the average European, which may partly account for the fact that the disease seems to have spread faster in Africa than in Europe or the United States. This may also partly explain why a disproportionate number of cases of AIDS in America in some high-risk groups are among blacks: black Americans also have a higher frequency of Gc 1f. Most Asians lie between Europeans and Africans in the frequency of the Gc 1f version of the gene.

There will now be a rush of people wanting to find out if they have the dangerous or the safe version of the gene. The procedure for identifying the gene from blood, called isoelectric focusing, is relatively straightforward, though far from cheap. But Dr Pinching issues a warning that his results are not nearly watertight enough for him to advise, say, somebody with the safest combination, Gc 2-2, to throw condoms to the wind. In the distant future, it might be possible to treat the disease by, for example, making antibodies to Gc 1f. For the moment, however, this discovery offers no relief from the growing epidemic—only some valuable new knowledge of the virus's vulnerability.

Oil rigs

A reef to catch a mackerel

What to do with unwanted oil rigs? When oil cost over \$30 a barrel, most rigs were expected to gush on well into the next century. At under \$20 a barrel, some will be plugged by the mid-1990s. Many of the 6,000-or-so rigs around the world have had their lives shortened by the fall in oil prices.

The proposed answers range from removing redundant rigs (which would probably cost more than building them did) to decorating them with fairy lights to warn off passing ships. A more profitable idea may be to let abandoned rigs become artificial reefs in order to attract and nurture shoals of fish.

The idea is not new. Japan has been building artificial reefs for more than 200 years. Since the mid-1970s, it has spent around \$500m on nearly 3,000 high-tech



Of their struts are coral made

reefs. Modern Japanese reefs come in various shapes and sizes and are made from steel, concrete and plastic, depending on the species of fish that fishermen wish to lure. In time, Japanese reef-builders reckon their use will boost Japan's fish harvest by 50%. The Japanese reefs already produce more fish than the entire catch from the North Sea.

In the shallow waters of the Gulf of Mexico, oil rigs attract shoals of fish, and fishermen, too. Fishing in the area became big business only when the oil rigs turned up. Some rigs even provide moorings for fishing boats. In America and Japan, reefs have been made out of just about everything from disused trains and trams to cars and tyres.

Just what attracts a fish to a reef seems to depend on the species. The hard surfaces of oil rigs entice soft corals, sea anemones, sponges, barnacles and a host of other invertebrates. These permanent residents in turn attract small fish and other invertebrates—which provide clusters of food for larger fish. Crevices in the decaying structures give shelter from currents and are a good place for fish to spawn.

That could be useful in the North Sea. As small fishing boats have grown into long-range trawlers, the area where fish may safely graze and breed has shrunk dramatically. Rig-reefs may augment these shrinking breeding areas by providing spawning grounds that are relatively safe from human—and other—predators.

The reefs would bring a two-tier structure to North Sea fishing grounds: young fish would probably remain near to the reefs, while adult fish moved to offshore waters, where they could eventually be trawled in larger numbers with less chance of endangering entire species. The alternative, if fish stocks continue to be depleted, may be a total ban on trawling during the

breeding seasons.

Aberdeen University Marine Studies Limited, a group of consultants linked to the Scottish university, is now after money from the EEC to build an experimental rig-reef in the Moray Firth in north-east Scotland. It hopes to dump large chunks—up to 50 metres long—of redundant oil rigs on the seabed, and examine the types of species attracted, how old the fish are and how quickly their stocks build up. The company's scientists want to find out how long fish stay near the reefs and whether they move between different reefs or simply return to the same one each time. They also hope to gauge the effect of inshore reefs (that is, those within three miles of the shore) on offshore fishing grounds. That information could, in time, bring more long-term planning and greater selectivity to commercial fishing.

One day, rig-reefs might improve the economics of North Sea fishing. By concentrating the fish into denser shoals in clearly defined areas of coastal waters, trawling costs could—in theory—be slashed. Rigs dumped in inshore locations, such as the Moray Firth, could be used to develop crab and lobster beds and to encourage shell-fisheries. One already operates successfully in the Firth of Forth.

Not everybody believes in reefs-from-rigs. Some conservationists worry that it might be hard to control which species of fish a rig-reef attracts; you might end up attracting fish that eat the species you want to encourage. Others think that creating an artificial reef could, in the long term, be more costly than simply dismantling the rigs. At least one big oil company has started to do the sums in earnest. An exotic scheme to tow North Sea rigs to the Mediterranean—where there are more species of reef-loving fish—has been ditched because it is too costly.

"And the most amazing thing to me
is: I get paid for doing this."

--Steve Martin

Scott Shields
4309 Drowfield Dr.
Dayton, OH 45426

Although I haven't written for the APA before, I have been reading over Roxanne's shoulder and putting my two cents into her contribution. Now that she isn't here for me to passively observe everyone's goings on, I plan to keep in touch on my own.

Dayton Hamvention: Things went surprisingly well at the Hamvention this year. Although, the weather was not as nice as last year and neither was the emotional climate, as Roxanne chose that weekend to move her things out of the house. I held up fairly well until the actual farewell scene, thanks to a great deal of support from Donna. It wasn't easy.

Attendance was off a little from last year (possibly due to the tensions or the circumstances), but I think that a good time was had by all. I was surprised that so few had seen the original "Max Headroom Story: Twenty Minutes into the Future" videotape. It's not what you would expect if all you had seen of Max was the Coke adverts (blipverts?). This was the first time I had rented that tape on the new 27" Sony and it does make a big difference in the performance. The frame is, at times, so highly packed with details that with the bigger screen it becomes almost possible to observe them all. Maybe it's just the fact that I have seen it so many times that I can look for more details without missing the main story. I definitely think that it is a tape that requires more than one showing. The television program does not do the original justice.

The other videotape that I showed, "Labyrinth", also deserves a second viewing, although the people who had seen it before indicated that they didn't really want to see it again when they could be socializing with people not seen too often. I understand this, but I felt that it was my position to keep people entertained and I knew that this is a film that the general crowd would appreciate. In this film, however, I think that the reason to see it again is for the general creativity and humor of the effects. My favorite is the scene with the 'helping hands'. Such a simple yet believable effect. My next favorite scenes are the talking stone walls and the tunnel cleaner just afterwards.

As I said, the attendance was off from last year, but here is the roster:

Mike & Alice Bentley
Marty Franz
Barry Gehm
Lee Hart
Bill Higgins
Bill Leininger
Roxanne Meida
Donna & Tullio Proni
Tom Snoblin
Dave, Susannah & Marlene West-Powell
Guy Wicker

And someone who slept out in a pick-up truck on the street whose name I can't remember. I hope I forgot no one. If so, chalk it up to writing this a month afterwards. The Hamvention is 'a go' for next year if my new housemate doesn't mind too much.

The next major event, in Dayton anyway, is the Dayton International Airshow and Trade Exposition at the Dayton Airport July 23-26 (Trade show Thursday through Sunday, airshow Saturday and Sunday only). I tried to inform people during the Hamvention that I will be going to the airshow and that I am willing to put people up for the weekend. So, I will use the APA for a general announcement of the event:

The First Annual (hopefully) Dayton Airshow Berserker.

Highlights include: Directions to the airshow, directions to the Air Force Museum, a cook-out for dinner Saturday (maybe chicken this time), and maybe some more videos.

Not so specifics: The price at the gate last year was \$7.00 (\$6.00 advance) and \$2.00 for parking. Highlights from last year: U.S. Air Force Thunderbirds, U.S. Army Golden Knights Parachute Team, P-51 demonstration, the Brazilian Air Team, F-15, F-4, with the Ohio National Guard air assault demonstration, B1-B flyover, Wright "B" Flyer, and many more! The brochure says that the Thunderbirds will not be here this year as they alternate years with the Navy's Blue Angels and the Canadian Snowbirds. There were also numerous static displays of aircraft from ultralights to a walk-through U.P.S. 747 cargo plane to a walk-through C-5 transport. The Dayton Airshow is mainly oriented toward military (how strange with Wright Patterson Air Force Base and the Air Force Museum here) contrary to Oshkosh which is mainly experimental aircraft. It is a big airshow and I would recommend bringing: a lawn chair, sunscreen, a cooler for drinks and/or lunch, sunglasses, plenty of film for your camera with a telephoto lens. Anyway, the invitation is open, but I would like an R.S.V.P. to know how many people to expect to feed. Also, anyone returning an R.S.V.P. will be supplied, free of charge, with a map of how to get to my house (useful if you haven't been here before, or even if you have).

Now to the planned text of my contribution. During the Hamvention it became clear that many people don't know what I do for a living. I work as a Production Engineer for the Instrument Panel Special Business Unit of the Interior Sector of Inland Division of General Motors Corporation. We build dashboards. While this may not sound too interesting, there is a great diversity of expertise involved and quite a lot of travel. Inland Division is a component division of G.M. that makes drum brake linings (asbestos), brake hoses (do you want one of these to fail?), steering wheels, seats, fiberglass/epoxy composite leaf springs, weatherstripping, ball joints, and as I said, instrument panels (I.P.'s in the business). The sector that I work for strives to someday make the entire interior of the car, hence the name Interior Sector. Specifically, I am a Tool Engineer who supervises the design, fabrication, set-up, and start of production of the machines, facilities, tools and the processing required to manufacture a dashboard. Currently I am working on a 1988 model year Buick and Pontiac product designated GM-10 (or 'W' body). These cars are the Buick Regal and the Pontiac Grand Prix for 1988. The GM-10 platform is the largest new model program that General Motors has ever undertaken. It covers four of the six car divisions: Buick, Pontiac, Oldsmobile, and Chevrolet (we don't have the

I.P. business for the Olds and Chevy, that went to one of our competitors, outside of G.M.).

When I hired on, I was working exclusively on the Pontiac GM-10 program. My assignment was to help in defining a process to glue a flimsy urethane foam backed vinyl to a rigid plastic substrate. Management had already sold the customer on the idea, the only problem was that they had no idea how or with what materials they would do it. A little background: past methods of dashboard production consisted of vacuum forming a sheet of hot vinyl, injection molding a rigid plastic carrier, molding the two together with a soft urethane foam, trimming and finishing to create a product that is aesthetically pleasing, meets the Government's requirements for head and knee impact during barrier sled crash testing (both belted and unbelted, driver and passenger), and meets our requirements for light and heat duration exposure. The plan on the Pontiac GM-10 was to mold the vinyl and urethane foam and glue the trimmed product to the injection molded carrier, under the auspices of material savings and simplified processing. That was the idea sold and we had to find a way to do it. With much help, we came up with a process that uses a two part adhesive that is applied by a robotic arm and clamped two minutes to handling cure. The specifics are protected by the company and we have already applied this technology on two other programs, one of which is going into production before the Pontiac GM-10. Anyway, without getting into too much detail, I work with processes such as: injection molding of plastics (2500 TON presses), vacuum forming and casting of vinyl, urethane foam molding, heated knife automatic trimming, hot upsetting of plastic, ultrasonic plastic welding, adhesives, robot applications (something I actually had classes on in school), and all the other little things that make my job interesting. Since November of last year, I have responsibility for both the Buick and Pontiac program of finishing machines & processes. Since last month, I have responsibility for all of the Buick program, but since it is already starting production, my work on this program is very light. I am now writing "Process Details", which are basically instruction manuals for each of the finishing machines and processes in the GM-10 program. I've gotten to learn two new word processors in the last month: Leading Edge on an IBM-PC and MASS-11 on one of our VAX systems.

As Roxanne has said, since January I have spent a great deal of time at our manufacturing plant in Matamoros, Tampaulipas, Mexico, where we will manufacture our GM-10 I.P.s. The plant is approximately 10 miles south of the border from Brownsville, Texas, a city at the very southern tip of Texas. In addition to being a great deal of 'fun in the sun', we get to cross the border to Mexico twice daily, just to get to and from work.

The saving grace is that the hotel that we stay at has a heated pool (75-80 degrees) and a Jacuzzi (110-150 degrees). We use the pool to unwind from the frustrations of crossing the border, working at a plant where you speak the language in minority, unfamiliarity with customs, resentment from the gringos at the plant (who are mostly Dayton transplants), and other problems associated with working in a poor foreign country. The pool area is beautifully landscaped with many palm trees, yucca plants, green lawns, and a sunken, swim up bar in the pool. Much to the hotel's dislike, we have been grilling out on the patio beside the pool once or twice a week as a break from eating out every night. As I said, the hotel really doesn't support what we are doing, but it is the best location for what we are doing, with large quantities of water available in case of a problem. They can't kick us out because G.M. business pays their bills. Sounds familiar.

They have just recently opened the pool bar, possibly to keep an eye on us. Our most recent diversion is pool ball. I was walking out to the pool for an after work swim and saw one of my co-workers sitting in a lounge chair. He reached into his ice chest (I assumed for a beer) and hit me in the chest with a Nerf ball that had been soaking with the melting ice therein. Quite a shock on a humid day in the 90s. Its the kind of diversion that helps keep your sanity, while being away from home so much.

The other highlight of south Texas is the beach on the Gulf of Mexico at a place called 'South Padre Island', to which I just saw MTV give a away a trip slated as 'the Riviera of Texas'. I don't think that I would go that far, but the beach is nice and along with the warm weather, provides some diversion from the monotony of working 10-12 hour days, six or seven days a week. As of the last trip, I have spent 84 of 139 days this year going to the Mexican plant.

Another diversion that I have just recently had is to fly in a small aircraft in the south Texas area. A coworker of mine has a private pilot's license and took me flying in a Cessna 150 (two seater) over the Brownsville & South Padre area. He has me interested in pursuing my private pilot's license again. I took ground school in Houghton while still working on my Bachelor's degree, but I never got any flight training. In fact, south Texas was my first flight in a small aircraft. The air was bumpy, and the aircraft was not well maintained. We had no radio and we had to cut our flight short because of a faulty fuel gauge, but I got to play with the control yoke, and became hooked.

We went up flying again today. Last flight we didn't have a destination or purpose other than just 'to fly'. This time we had a real mission. We flew to Middletown to have breakfast. Middletown is a small town midway between Dayton and Cincinnati, hence the name. We flew a Cessna 172 (a four seater in much better keep than the plane in south Texas) out of a small airport northwest of Dayton called Phillipsburg and went due south to Middletown. We didn't get much above 2700 ft. MSL due to haze (the elevation in this area is between 700 to 1000 ft. MSL). But, it was still high enough to have some fun. I flew (somewhat shakily most of the way to Middletown and after breakfast, I was able to steer the aircraft as we taxied out to the runway. This is more difficult than it sounds. You have to use your feet to control both the rudder direction and applying the left and right brakes. While flying back to Phillipsburg, we did some stalls just for the fun of it, and my pilot friend flew for a time just at the stall speed with full yoke back to show how stable the aircraft is. The aircraft just likes to keep flying. Definitely a quality I like in an airplane. I flew some of the way back to Phillipsburg with just a little difficulty in setting the elevator trim. I was trying to reduce the pressure that I had to keep on the control yoke, but I kept overcompensating. I guess I just need more practice. It's an expensive hobby. With breakfast, it cost us each \$20 for just under an hour of flying time. Maybe next time we can cut out the meal and just have coffee served on the plane, while we are in the air. (Reference to an American Airlines T.V. commercial about the world's first business flight, in which a business traveler is driving to a meeting and his car breaks down. Seeing a two-seat biplane (it may have been a prop duster), he asks the pilot to fly him to his destination. Upon their return, the businessman comments that it was a nice flight, but it would be nice to have coffee on the next flight. The aviator says: "Now let me get this right. You want coffee. . . . on the plane. . . . while it's in the air?")

Mailing Comments

North by Northwest by... The circuit to the kitchen used to go through the fuse in the furnace? No wonder you had problems.

I use a very similar oatmeal cookie recipe that uses more brown sugar and less white sugar. A very good recipe. Small cookies are good for dunking in narrow glasses of milk. Have you tried Alice Bentley's soda bread? Another good recipe that you could probably get out of her with no arm twisting.

Crumbcrunchers Thanks so much for the thank-you card. I appreciate it. You are all certainly welcome for next year.

I will use your comments about rebuilding airplanes to plug one of most interesting airplane kits that I have ever seen. It's called Whitewings. They are called paper airplanes but are actually thin cardboard sections that you cut out with an X-acto knife and laminate together. You fly the planes outside with a catapult (indoors is too small for the velocity required by their weight). The sections are laid out with the grain of the cardboard and are stiff enough to allow warping after assembly to create airfoil shapes. I haven't flown mine yet since building some during the winter, but plan to 'real soon now'.

Applause for your comments about parenting, but as you stated, everyone says: 'That's not the way that I would do it.'

Transporter Topics Why separate Lazer Tag from the fake bomb exercise? In both cases, the opposition is trying to get you first. Hasn't the bomb-maker pitted his cunning and skill against yours, similar to a hide and seek gunfight?

Biting the Bullet While we weren't there during the melee, I wondered how bad things were with all of those plastic bullets lying around. Maybe all the people 'playing the game' should wear bulls-eye targets, but I don't like the idea of being hit by a wayward shot.

Dr. Gonzo I guess that I am somewhat surprised that Caribbean Spanish food is so much different from Mexican Spanish food. They still use plenty of rice, but they also use plenty of beans. The thing I dislike is how everything is cooked in lard. They sell it down there in five gallon buckets. Maybe cholesterol is why you don't see many old Mexicans. The driving sounds very similar. Very laid back with little adherence to traffic laws. This is a bad habit to pick up when driving back into the much stricter enforcement in Texas. I drive much more carefully in Mexico than I do in the States because; who is the Policia going to pick up for a traffic violation, a poor Mexican who can barely afford a car or a rich gringo in a rental car?

Thanks for the comments.

Just What I Needed I enjoy the franked material, when I get a chance to read all of the stuff.

Re yr ct Dave. Can't you just turn the color off on your color television? Colorization wasn't implemented to make the classics 'better', but to make them more appealing or sensational to the masses (apparent from the titles selected). "Turnerized"

Thanks for the comments as well.

Amorphous Sorry that you didn't find what you were looking for here. Maybe next year?

View From the Projection Booth

another APazine

by

Steve Salaba

610 Luella Court

Kalamazoo, Michigan 49001

(616) 345-9651

This zine is 100% completely un-colorized

Hello again! My Big News is that I've just sold my Commodore Computer system, software and all and I am going to (attempt to) get a Mac. Alex is working on locating a used Mac for me even as I type this on *his* Mac. It seems that after getting to work on a *real* computer, I don't want to play with a measly 64K and an incredibly slow disk any more. Not that I'll ever need megabytes of memory or anything like a hard disk, but after finding out that I like owning a computer, it's time I moved up. Since I've actually been doing something useful on my computer (printing out my monthly bill-paying checks) I'll have at least three weeks to get another system or I'll have to (gasp!) write out my checks by hand. What a concept! Slave to the Machine, that's me!

There has been some talk about Colorization (tm) in the last couple of issues, and I think I'll put in my own observations here instead of in Mailing Comment (Besides, I foolishly left my copies of the last two issues at home, and I'm typing this at Alex's office...) Re: Colorization - I'm afraid I'm getting used to it! Though I still do not like the process used by Hal Roach and his partners, Colorization, Inc., I have begun to tolerate the method used by Ted Turner. Of the former, I've only seen two examples; *Way Out West* and *Topper*, both of which looked like a black & white photo touched up with colored pencil. I did rather like Mr. Turner's version of *Captain Blood*, a film that, to my mind, should have been made in color in the first place. In general, I tend to agree with Roger Ebert's views:

1) Colorization is a video process, and does not mean that the original black & white prints have been destroyed.

2) If it really starts to get to you, just reach out and turn the color knob on your TV to zero.

I also read recently, however, that the BBC originally refused to run any colorized films. Then they decided not to run any colorized *classics*, just colorized trash. And finally, back to no colorization at all. I have also seen recently a video store selling both original and colorized versions of the same movie. And at MediwestCon last Memorial Day weekend, they announced in the program book that the video showing of *Casablanca* was "uncolorized", which I envision as a wonderful new process that leeches the color out of films that should never have been made in color in the first place.

My complaint with this process is minor, but annoying to me as a film buff and historian. People are forgetting their film history. Two examples:

1) The day after this year's telecast of *The Wizard of Oz*, a listener called in to a morning radio show to ask the announcer if the film had been colorized because they remembered it being in black & white. The announcer didn't know the answer (!) until a half-dozen callers explained that the beginning and end of *The Wizard of Oz* had always been in black & white, and the Oz sequences had always been in Technicolor.

2) In the weekly TV section of my newspaper there is a syndicated question & answer letter column. Someone wrote in to ask if *Gone With the Wind* had been colorized as they remembered it as being in black & white! The answer was, of course, that *GWTW* has always been in Technicolor, and the viewer must have had a black & white TV.

As I said, a minor complaint, but... How quickly they forget the glory that was *Technicolor*...

On page two there is a small bit of *franked* material regarding the "Chuck Berry" cover a few issues ago. I must assume that Bonnie Jones knew about this when she drew that cover. Right, B. J.? It is something I also should have remembered but sadly had forgotten. And I still think that sending the Enterprise crew back to 1956 to kidnap Chuck Berry would have made a great plot for Star Trek IV.

The rest of the *franked* material was actually written by an engineer at Electro-Voice (on one of his off days, no doubt) and re-typeset by me (hence the typos). If I get a chance to come back here to The Office and work some more, there will be Mailing Comments. If not, Bye for Now...

I'm back.....!

Something interesting happened at work this week. Mike, the maintenance man called long distance to order a part and was told that the person he needed to speak to was out to lunch, call back in an hour. When he called back, he mis-dialed one digit in the area code and the conversation went like this:

Long Distance :"(mumbled hello)"

Mike:"Let me talk to Ken."

L. D. : " Look, mister, this is the Johnson Space Center. We got five thousand people working here and you want to talk to *Ken*??"

Mike: "Oops! Sorry, wrong number."

Just in case you wanted to know, the number he dialed was (713) 483-3265. I don't know if this is a number you can get from information or some internal line, but what the heck. It might have been even more interesting if he had gotten the Johnson Space Center *computer*.

Mailing Comments

Rolf : Re yr ct to Uncle Bear: I flew in my Uncle's plane this Xmas when I went to Arizona, and it was the first time I got to see an auto pilot in action. My uncle pushed a few tiny buttons, sat back with his arms folded, and the plane flew itself. Maybe I'm easily impressed, but...

Crumbcruncher S.W.: Speaking of sesquicentennials, there have been commercials on TV recently where Michigan residents attempt to pronounce the word, and all fail miserably. It makes all Michiganders look like illiterates or something! Personally, my favorite mispronunciation is "Sexiquintessenal" Re yr cmt to Dave L re "Miracle on 34th St.": I also saw it, and though it was not particularly good, it was better than "*Topper*". See above. And, yes, they have colorized "*It's a Wonderful Life*". Mostly, I think, to re-copyright the film, which recently fell into the public domain.

Dr. Gonzo: Always enjoy your History & Geography lessons, about as far from a dry textbook as one can get. Naturally, I liked *Radio Days*. Though at many points I found myself marvelling at the amount of work that went into setting up each shot, what with the crowds of people, the intricate lighting, all the details of costume, props, etc. Even the large mechanical signs on the rooftop set. I used to think of Woody's films as being relatively low-budget personal movies, but it seems the budget can get bigger and the technical details more extravagant without the film losing that personal touch.

Annette : Nice seeing you in E. Lansing, but the visit was all too short. Too bad I was involved with programming at MediaWestcon or I could have hung around longer.

Barry: Ditto.

Greg: Speaking of *Fractured Flickers*, have you seen the film show that's been "touring the country" recently called "*An Evening with Rocky & Bullwinkle*"? I was disappointed to find that it is only some 16mm, mostly black & white, unrelated episodes, including a few commercials. I was hoping for 35mm.... Speaking of which, I just saw a trailer for a coming theatrical feature called *The Puppetoon Movie*. Then I saw it mentioned in Starlog. Prints made from pristine 35mm nitrate originals, some culled from the UCLA library! Rarely seen George Pal stuff, most of it in uncut form! Don't know if this stuff turns up more in CA, but it sure doesn't turn up in MI. Also, re epigraphs: There is a Talking Heads song on a tape I have which has a great line for a Tullio zine (offered free if he wants to use it)... "down in the basement I hear the sound of machines..." You know, I've never actually heard the "Snoopy Ruxpin". I should ask for a demonstration some day. Did you see the telephone built into a talking bear? Did I mention that last issue? Am I losing my mind?

Unfortunately, the dotted line on the screen says that page two is coming to an end. And so is my zine. One last comment, though I am also guilty: LESS FRANKING! Bye now.

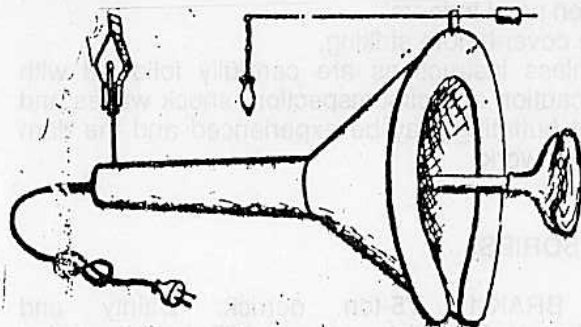


Fig 13 - Model SP13.5TRBXWK

Unequivocally, undeniably, doubtlessly, without question and really this is the most amazing, remarkable, revolutionary, sensational new development ever revealed, ever, honest! When you see this terrific unit you won't be able to contain yourself! WOW!! Silky highs! Woolen lows! Complete with vital "presence" and "absence" controls! Your friends will scream with envy when they hear this new speaker! Amazing new exclusive 3-way, 12-d, binaural relief port eliminates spurious propagation of intermediate, and undesirable biped, tertiary grid leaks! No messy floors to mop! WOW! This new reproducer incorporates a new, ridiculously simple principle which our engineers can't explain yet! 13 extra octaves of added bass when the unit is coupled to a bowl of oatmeal. Think of that - just think of that! WOW! Complete, self-contained including new "wow" filter; nothing else to buy! (See page 2 for accessories.) Comes with new 5" cable and new genuine combination "Good-luck" charm and stylus pressure gauge!

Mr. Fafnir N., Horse Cave, Ky.

"Send me another- my canaries love it- it's for the birds!"

Miss Brunhilde S., Horse Cave, Ky.

"This thing scares me!"

Mr. Clyde T., Horse Cave, Ky.

"I'd send it back, but the postmaster won't touch it!"

Fig. 5-Actual Testimonials
from Satisfactory Customers

FEATURES:

IT'S HEAR!

NEW! THE SPEAKER THEY SAID "COULDN'T BE MADE!"

You won't believe this! WOW!

Top Extra High Fidelity!

Unprecedented! Superb! Unexcelled! Amazing!

Unnerving! Undirectional! WOW!

SPECIFICATIONS:

Frequency response: DC to middle of Channel 5
±3 inches (see Fig. 39)

NRA Sensitivity Rating: 98.6

Free-Space Cone Resonance: Huh?

Power Handling Capacity: 110-220V 25 Cycle
AC-DC 3 phase

Critical Damping Factor:

In an infinite baffle: .001

In recommended orange crate: WOW!

Distortion: Don't mention that word!

Magnet Weight: 3 tons

Size: 5'4" wide x 17' narrow x 13 1/16" high x
\$7 short

Mounting: 13 miscellaneous size holes randomly,
spaced at uneven intervals in a haphazard way

Net Weight: 73 tons

Shipping Weight: 68 tons

Price: \$7,907* Audiopill Net, F.O.B. your
nearest tar pit. Comes completely unassembled
in three box cars.

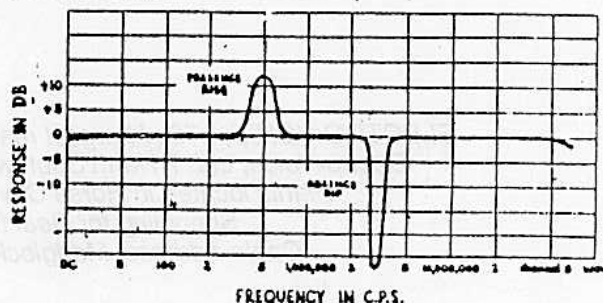


Fig. 3- Frequency Response at 791-watt Level

INSTALLATION

If you are left handed, start with step "f" and reverse procedure.

- Connect the 300-ohm twin-lead from the UHF antenna to the terminals marked VHF ANT on the rear of the chassis.
- Connect a short length of 300-ohm twin-lead between the terminals marked UHF REC on the rear of the front chassis and the UHF antenna terminals marked AFC on the front of the rear chassis.
- Connect the 300-ohm twin-lead from the UHF antenna to the terminals marked WOW ANT on the side of the front chassis.
- Connect a short length of 300-ohm twin-lead between the terminals marked VHF REC on the front of the side chassis.
- Connect a short length of 300-ohm twin-lead between the terminals marked TV REC on the side of the rear chassis and the UHF antenna terminals marked REC ANT on the receiver chassis.
- Connect the VHF antenna to the terminals marked FM ANT on the rear of the rear chassis.

NOTE: If a short length of 300-ohm twin-lead is not available, use two short lengths of 150-ohm twin-lead or cut a long length of 600-ohm twin-lead in half. If more than one UHF station is to be received, the automatic on-off switch may still be used as outlined above under Automatic "Operation". If this feature is not desired the front panel on-off switch may be used and the AC receptacle on the rear chassis disregarded; in this case, disconnect a short length of 300-ohm twin-lead.

When connecting interconnected connectors, take care to connect the connected connecting connectors to the unconnected connections, interconnecting the disconnected connectors with a short length of 300-ohm twin-lead. Otherwise constrampulation of the transmogrifactor will cause interpolation of the contracoustic control. WOW!

CAUTION NOTES:

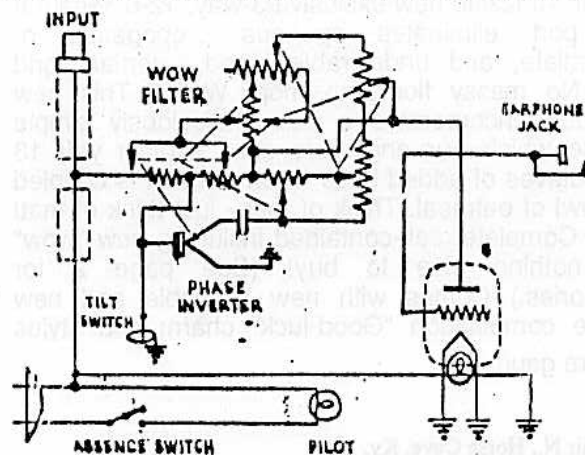
- Do not operate this speaker within 200 feet of Aardvaarks and 3-toed sloths as this thing will cause untold agony and immediate disintegration to the aforementioned above.
 - It is imperative that all inputs and outputs are grounded so that output is reduced to the doorstep of pain when used indoors.
 - Close cover before striking.
- N.B. Unless instructions are carefully followed with utmost caution and circumspection, shock waves and turbulent buffeting may be experienced and the darn thing won't work.

ACCESSORIES:

Model BRAK-1. 75-ton derrick. Dainty and inconspicuous for quick, easy mobility when moving unit for dusting, relocating, mobile operation.

Audiopill Net(with steam engine).....\$7,907
Model BRAAK-1. Furnishing Kit. For interior of packing crate. Use this handy little accessory to convert the SP13.5TRBXWK packing crate to an additional room for your home. Comes in Battered Blonde, Weather-Beaten Mahogany, & Box Car Red.

Audiopill Net.....\$790.70
Model BRAAAK-1. Birdcall adapter. Special sonic generator either attracts or repels birds of all types. Complete with 1,239 position bird selector switch and 7x50 coated binoculars for watching birds come and go. Please specify birds desired.
Audiopill net.....\$79.07



Schematic Diagram

ELECTRO-VOICE, LTD. / Largest makers of ear trumpets and stuff in the country.

Electro-Voice, Ltd. 7 North Southwestern Ave, East Westerly, South Dakota

Plants located in Horse Cave, Ky. and Kinnikinnik, Connecticut

Shopping for Real Estate in Horse Cave, Calif.

Cable Address: Madglockenschpielermitgongennoisenlab

WHEN first contact is made between humans beings and life forms from another world, it's possible the aliens will have already heard the music of Chuck Berry. Even as you read this, a copper phonograph record sprayed with gold and attached with titanium bolts to the side of Voyager I is speeding through the galaxy, bearing a 120-minute recorded message from the people of Earth to whatever civilization finds it. The record contains greetings in many different human languages, blips that can be decoded into black-and-white and color photographs and 90 minutes of music, ranging from the first movement of Bach's Brandenburg Concerto No. 2 to "Johnny B. Goode" by Chuck Berry.

UPWARD MOBILITY

What a country!

An APA-Tech Zine by:
Bob & Connie Trembley

For those who have not heard the news, I (Bob) got a new job! I'm now working at Ovonic Imaging Systems (OIS) in Troy. So now there are 4 old time PFRM/Mich Tech Alumni there: Guy Wicker Tom Snoblen & John Lussmyer. Just the other day another PFRM got a job with Energy Conversion Devices (ECD), the parent Co. of OIS. The FANs are taking over! The only drawback is that I no longer have my BITNET ID, but that is about the only worthwhile thing I left behind at EDS.

I had had 2 interviews with various persons at OIS, and I had a feeling that I would be working there in the not to distant future. I was at work on a Friday when Connie called me to tell me that OIS had just called and wanted to offer me a job (*GACK!*). They wanted me to call when I was able. 30 seconds later I was on the phone to them. 3 hours later I was in Troy. 3 days later I gave my notice to EDS.

So, now I'm actually doing something in my degree (BSEE - Computer Engineering), and still using the programming knowledge I have. Right now I'm on the upward edge of a giant learning curve. I'm refreshing myself with logic design and assembly language programming, learning about the 8031 microcontroller, and the SCSI (pronounced "SKUZZY" meaning Small Computer System Interface). I will also be learning "C", Microsoft Windows, and 8088 assembly language. I'm going to be writing programs for both the IBM PC and the MAC. They are also discussing setting up all the PCs on a LAN. Should keep me busy for a while.

One of the nicest things is that I get over-time, and I don't mind working it because I enjoy it. This, in addition to the considerable pay raise I got, means that I can actually frame some of the artwork I bought so long ago at cons. Of course, it also means that I can buy more art. Sigh. Actually, Connie and I have the new budget all worked out. We are paying ourselves X dollars, just to blow on ourselves. A considerable amount is going into the bank (finally), and a small portion (for now) is going into a mutual fund. The rest is going to paying off the evil plastic card(s).

With my car being paid off in Jan '88, I will probably have the funds to get a computer. I'm having trouble deciding what to get now. I'm 3 years familiar with the IBM PC. I know the operating system is bad, I know that the architecture is flawed. I hate to say it, but I can use it fairly well, and do, all the time. I also know that the M68000 can run rings around the 80286. I have had the opportunity to use the MAC at work, briefly, and I want one of those, too. A friend is trying to convince me to buy an Amiga 2000 with an 8088 coprocessor card. That way I can do hefty graphics/animation, and still use the programs I am familiar with on a "PC window." Decisions, decisions.

Connie, Rachel and I will be going to AD ASTRA in Toronto June 12-14 with Tullio & Donna, possibly Roxanne, and possibly Guy Wicker. It will be good to get away for the weekend, it will be

good go go to another con! We will be meeting a couple we know from Mich Tech there (Dick & Crystal Fernholz). They just got back from Germany, where Dick was working on his PhD in Physics.

That is another thing good about working at OIS. Tuition reimbursement is in the works. When it goes through, I will probably go for a Masters in computer science, specifically computer graphics. OIS also bought me a membership in the IEEE Computer Society, and when I get my card I'll be signing up for the ACM (SIGGRAPH & SIGSMALL/PC).

Mary Lynn & Todd called us the other day with an "offer we couldn't refuse." They said that (get this) Highland Appliance was selling 8 inch Star Sculptures for \$200.00. They wanted to know if we wanted one. HA! So, whenever we get around to visiting Chicago, we'll pick it up (I am not going to trust this to the Post Awful.) Highland may or may not be taking rain checks...

Connie and I just got done reading the Darwath Trilogy by Barbara Hambley. We both enjoyed it a lot. Lately, I seem to have slipped from reading a lot of hard SF to fantasy. Not that I don't like hard SF anymore, it just seems kinda strange.

Of late, I am designing my first D&D world. I want to use it in Traveller also, so I started by rolling up a complete star system: moons, asteroids, gas giants etc. Then I took my world and, using some rules from a journal, put tectonic plates on the surface. I then placed the continents on the plates. This gives me a real good idea where mountains, volcanoes, and islands will be, and where earthquakes can be expected to occur. I will concentrate on part of a larger continent, and place cities, rivers, lakes etc. I'll then map out a couple major cities and ruins. If anyone has any suggestions, comments, or questions.....

ISHERFUND

Connie and I visited Tullio & Donna a few weeks ago and handed them a check for \$550.00 for the water heater! Thanks again to all the people who pledged, but, more importantly, more thanks to all those who actually sent money. For those of you who didn't, we know where you live, and ritual public humiliation can be harsh.

MAILING COMMENTS

GUY WICKER:

My sincere apologies and condolences. If I had known that giving you "Starflight" would cause such grave physical and mental conditions, I wouldn't have done it. Guy, it's only a game. Eat. Get away from the monitor every 7 hours or so. Sleep. Go visit someone out west, and leave the computer. Hide the disks.

-Bob

ISHERFUND UPDATE

Connie Trembley

It has been awhile since I've written about the Isherfund, so here is the current update. Two weeks ago we visited Tullio and Donna and presented them with a check for \$550.00. They now have to get an estimate for a new hot water heater, and see how much it will eventually run them. I am still accepting donations, and anything that is collected above and beyond what the hot water heater will need will go for some other household repair or project, depending on what Tullio and Donna want done.

Below is my record of who has paid and who still has to complete their donation if your name does not appear and you know you donated just drop me a line in the APA.

Paid:

Todd & MaryLynn Johnson	Bill Leininger	Scott & Roxanne Sheilds
Barry Gehm	Sam Paris	Bonnie Jones
Guy Wicker	Alice & Mike Bentley	Joe Furstenburg
Rolf & Mary Wilson	Sheila Groves	* Bill Higgins
Dave Alway	Parr Crome	John Hall
Marty	John Frambach	Doug Price & Jane Haldeman

Still To Pay:

Bob & Connie Trembley	50.00	pd 30.00
Phil foglio	30.00	
* Bill Higgins	20.00	

There were also a couple of anonymous donations, thanks to everyone it looks like there will be hot water at Ishercon 10. If there are any mistakes or if I've forgotten you let me know.

INCORRECT THOUGHTS

for Apa-Tech #52

by

Marty Franz

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But you **can** do multi-tasking with an IBM PC. I'm doing it right now... just snag as many Zenith Z181s as you can, one for each task you want to do. Get a chair with casters so your task switches run fast (very important for overall system performance) and then wheel between machines. As I write here, in "foreground" on one Z181, another Z181 is printing a listing. It really works, it's here now, and it'll probably work better than OS/2.

I've been busy lately, working, writing, and in general doing That Programmer Stuff a lot. At work, we are evaluating slave CPU cards and terminals, a new role for me: I call people and try to get evaluation units For Free so we can see if they work and if we should buy 500 or so of them. I spend a lot of my time with a phone in my ear now instead of pounding keys. They all say this is good grooming for Management, but I haven't seen any of that yet, and I still have to fix the code I've written over the last few years, so who knows.

I attended COMDEX in Atlanta week. It was my first visit to a trade show in some time. I was amazed at how "corporate" the show was: the last shows I attended were the West Coast Computer Faires in '81 and '82, and computer people still wore jeans and T-shirts. Not here, however: just acres of people in suits, with an occasional open collar in deference to the 95-degree, 100% humidity climate. Like the people, the products were stamped out with the same cookie cutter: 80386 systems, desktop publishing software, and laser printers. The computer industry may be successful, but it's not terribly innovative at the present time.

On the plus side, I visited with Jeff Duntemann and George Ewing, and we prowled the press and publishing booths for awhile. Jeff, some of you may know, is now Editor-In-Chief of Turbo Technix, a magazine due September 1 from Borland that will cover all the "Turbo" languages: Pascal, C, BASIC, and Prolog. Jeff says he's hungry for articles on any of the four languages and will Pay Well. Seems I've heard the name of that magazine somewhere else...

I was in Chicago a week ago, too, on the way to COMDEX. Thanks to Mike and Alice for housing me on the way, and hello again to everyone at Sam's birthday party. I'm sorry I missed you Valli and Joa, I hope to see you both when you head East later this summer... I'll be good in the meantime.

While I was in Chicago a number of us were talking about the **USS Stark** and the West German pilot who flew all the way through the Soviet air defenses to land at the Kremlin. Both events point out the problems with expensive weapon systems and the people who crew them: somebody always forgets to turn the radar on, an Exocet doesn't explode, aircrews wait around for a decision to shoot a plane down or not. Our high-tech armies and navies are an incredible waste of money, maintained for political and not military reasons. SDI developers take note.

Susannah The Kentucky Hot Brown sounds delicious.

Rod Leave out those modifiers. What you write should provoke a reaction. // Tullio has been writing StarFire for the Macintosh and should have the game ready by Ishercon. A fairly successful strategy has been to make lots of cheap ships with a few shields and weapons-- sort of a "Gary Hart" class escort. This strategy assumes ships can't engage more than one target at a time, though.

Greg Rats. I expected lots of formulae. Assuming you had something with a little more punch, where would you put it? This discussion is inspired by The Songs of Ancient Earth: it's the way the crew of Magellan plan to terraform Sagan Two, moving it closer to its primary star to heat it up.

Rolf The Cambridge Buskars have been (in)frequent guests on **Prarie Home Companion**, which we don't get around here anymore. // Re yr ct spelling checkers: I've seen one that didn't use a dictionary, but relied on frequency tables (figuring there weren't many words around that had the letters "xq" adjacent to one another). It was heuristic, adding what you wrote to its tables after finding typos. Statistically, it did as well as dictionary-based programs. This ought to do better with fannish and technical writing.

Valli Well shoot, I was hoping to see you two last week. Sorry about that. Sometimes I get Kazoosick too. It was nice to talk to you, however.

Well, it's late here. Time for me to fold up the nineteen Z181s that now fill every flat space here and go home. Thank God I work on an advanced machine where fonts are not named like Pepperdige Farm cookies (Bermuda... Rio... Zapf Dingbats for Chrissakes) and no crude rodent pointing devices are needed to manipulate obscure ideographs. I don't have time to learn easy-to-use software anyway.

Max . . . WE'RE car number 5

Rolf Wilson
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I bet you were already tired of hearing about me and my search for a new car. Hang on, it gets more exciting.

I took Friday, May 15 off to shop for cars up north. I had all my Consumer's Reports info, a list of car dealers, and an intense interest in seeing if the methods of shopping that I had been reading about would actually work. Once I got onto the interstate, I remembered that the speed limit had been changed to 65 outside of town. However, the old Chevette seemed to have something in the gas line, and refused to go over 50 for a good while. Finally, it cleared up, and I sailed along nicely. Many people were driving slower than 65. Then there are the scofflaws who will speed at any limit, and I had the satisfaction of seeing some of them pulled over for tickets. So I made my way to Indiana, where there are several large car dealers near to US 30. First stop was Toyota of Merrillville, which happens to be in Crown Point. I told them that I was shopping for price, and casually carried my price printout from Consumers Union. Actually, for this guy, it probably didn't help any. It was his first week on the job, (one source suggests that you should try to find a young salesman, who might be under considerable pressure to make sales) and he might not have recognized it. He was polite and helpful. I learned that it might be hard to find a Toyota Camry wagon with a stick shift. Most people who buy wagons seem to want automatic. Also, due to the fact that Toyota makes them no other way, you would be forced to buy their fancy floor mats and speaker package. I don't think he was lying to me - every other Toyota dealer spoke to confirmed this. The whole thing took less than 10 minutes.

Next, a Ford dealer along US 30. Again, a request for a price on a specific model was met politely in just minutes. This seemed to be going well. Then I talked to a Plymouth dealer nearby. I found a random salesman.

"I'd like to get some figures."

"Figures? What do you mean, figures?"

"Sorry, I mean prices."

"Trying to be cute?"

I was somewhat taken aback by this, but we managed to make it over to his desk.

"I'd like to get a price on a Voyager."

"So what do you think is a fair profit for me to make?"

"I don't know."

"It sure looks like you're trying to know." (Referring to printout) "What does your book say I should make?"

"Well, if I'm going by the book, it says that you should set the price."

"Screw the book!"

"Goodbye."

This fellow was the exception. Almost everyone else was polite. One fellow declined to give me a price at all, telling me to come back there last. I told him that I couldn't but he didn't seem bothered. One fellow tried to sell me something on his lot, telling me that there would be \$700 extra cost in ordering a car. One fellow told me that the car I wanted did not exist in that configuration.

It was all very interesting. My price printouts were mainly for effect, to reduce the nonsense that many salesmen will try to put you through. I headed back home Sunday, glad that I would be getting a new car. It sounded like the muffler was going bad on the Chevette. Three hours of driving with a noisy muffler in a noisy car is hard on you.

About 2 hours after I got home, I decided to get all my price quotes out of the car to compare them. This would take some figuring, as some of them had include shipping and taxes while others had not. Also, some dealers disagreed on what options were actually available on some models. But when I went to open the car, it was full of smoke, and the back seat was on fire. It had just burned up through the seat from the exhaust system,

and was starting to burn a small hole directly in my stack of price quotes. Talk about revenge!

All I did was stick a hose into the seat for some time, then rip all the foam out. Everyone kept telling me that I should have called the fire department, but I just kept thinking of all the firemen telling Uncle Bear "Yep, sure is out"

When we took the car in to see if it was actively dangerous to drive, the bill to repair it would have been more than I thought the car was worth. The mechanic offered me \$75 for it, mainly for spare parts. The tires were probably worth that much, but it would have been expensive to fix the exhaust system and sell it to someone else, so we sold it, leaving us with no car whatsoever. It is amusing to note that \$75 is the exact price that I sold my old 400K external disk drive for my Mac for. And I thought IT had depreciated!

Luckily, my brother had an old car that we could use for a few days, while we looked for 2 vehicles. We quickly bought a 1980 Datsun pickup, just for running around town and moving stuff. It is only 1 year younger than the Chevette, but is in much better condition. We also went around town getting prices on new cars, using my slightly singed price quotes to drive their prices down.

"We have a better price. \$2000 better."

"OK, I can match that."

Remember THAT the next time you are buying a new car! Well, as of today, we have not bought a new car. This means that you will be treated to yet another episode of this.

For those of you who were in ChUSFA, you will be pleased to note that we finally have a room in the Illini Union again. Or perhaps a large closet. Armed with measurements and Superpaint, we found a way to put 8 bookshelves 4 feet wide into a room 140 inches long by 82 inches wide (with one corner chopped off) There will even be room for people to squeeze between them!

A little more has been done on our house. The small back roof was in much worse shape than the main roof, but we had been putting off getting it fixed. When a piece of wood under the eaves rotted out and swung down to hang Damocles-like over our back door, we finally got moving. I called the contractor who had done some work for us before, and caught him waiting for some permit to come through on a big project. So he had 2 days to do a small job. Within hours, he had started. Of course, this was the first day in 2 months that we had a thunderstorm. But they knew what they were doing, and had left enough stuff up to keep the inside of our house from getting wet.

With part of our tax refund, we bought a Thunderscanner for the Mac, and a game called World Builder. I haven't tried out the Thunderscanner yet, but the game looks interesting. It is a program that allows you to build your own adventure games, complete with graphics and sound. You could also use it for other things - I plan to make a tour of our house, and bring it to Ishercon this year to show people.

The other program that has been keeping me entertained is Ars Magna, which produces anagrams. I have been making puzzles and bringing them to work. The first time, I handed them out in the morning, and brought the section to a halt for half an hour. Now I hand them out at lunch. Maybe next issue I will do anagrams of some of your names, or give you a puzzle. The next one I am doing at work will be on movie stars. Did you know that "genuine class" = "alec guinness"?

MAILING COMMENTS

Transporter Topics - I never did get around to replying to your comment about using screwdrivers as prybars, so it seems Greg did it for me. I thought it nice of Greg to defend my screwdriver that he has never seen, so I decided to see if it was worthy of his praise. First, I took a sledgehammer, and drove it through a 4 by 4 (cross-grain, of course) There was no damage to the tip, but you could tell that someone had hit the butt with something. It wasn't shiny any more. Then, to test it for use as a pry bar, I drove it into a gap between some bricks in my basement wall until it was solidly fixed; then grabbed a window frame and pulled on it as hard as I could. I may have caused a tiny deflection while pulling, but nothing permanent. I don't think I could bend it permanently short of setting it in cement and going after it with a sledgehammer from the side. I accept your statement as a good general rule, but I believe that this particular screwdriver qualifies as an exception to that rule.

Dr. Gonzo - I don't really have anything in particular to say about your zine except that I always enjoy reading them. You should write travel books, or something.

